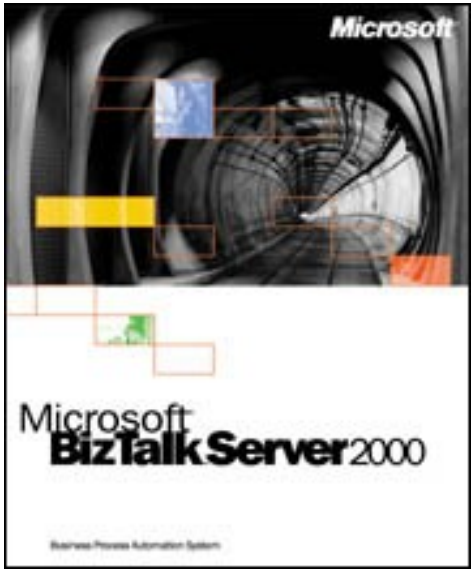
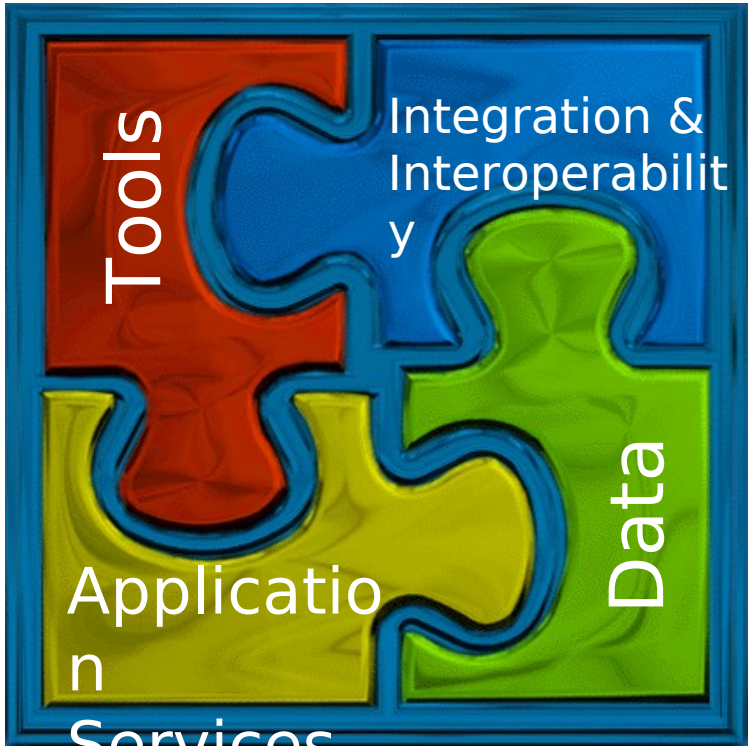
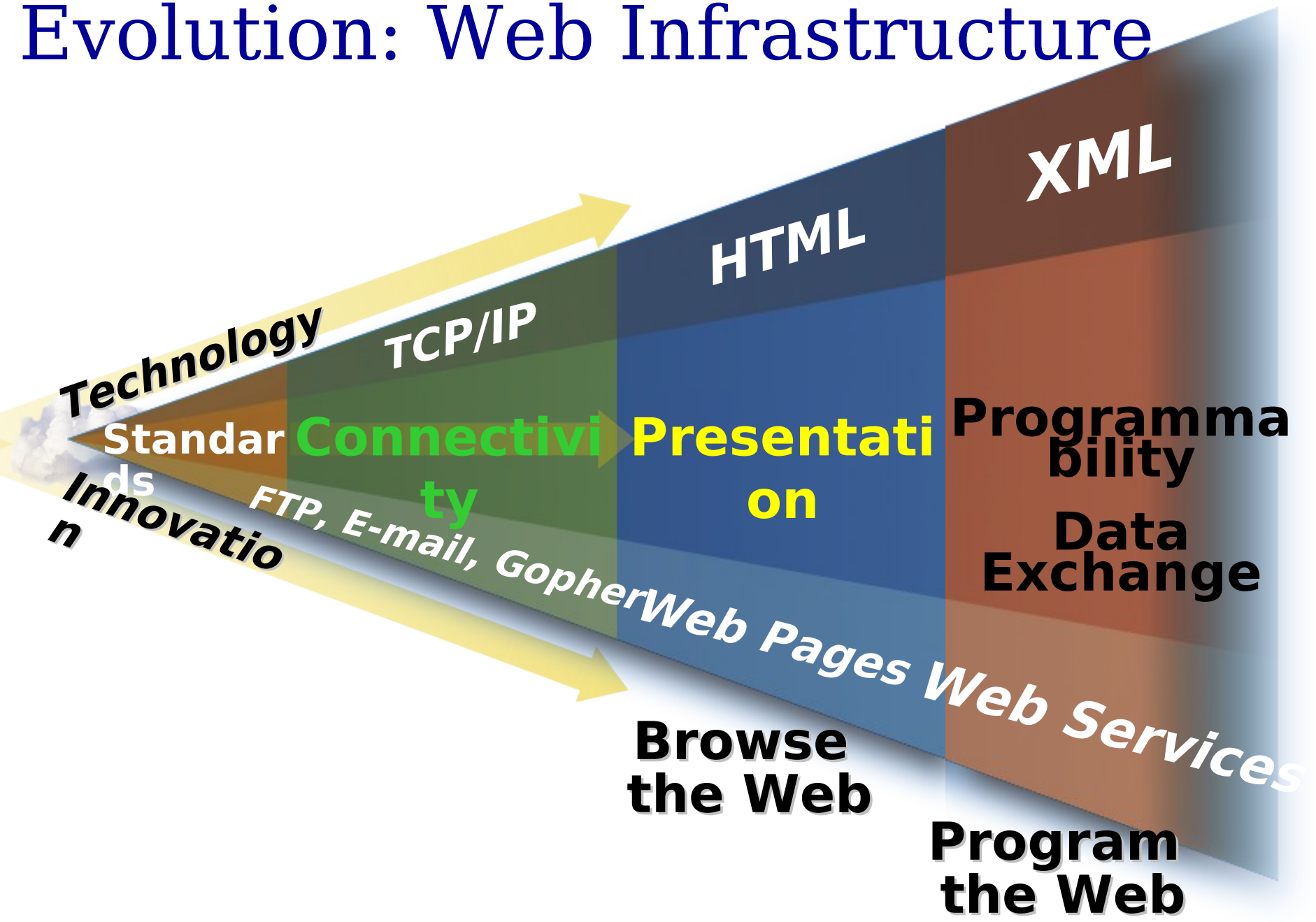
BizTalk Server 2000, Driving Business Process Automation





Bob Angrisano,
Sr. Principal Technologist
PACWEST District
Microsoft Corporation

Evolution: Web Infrastructure



Example: Self-descriptive Data

Data stream in a typical interface…

“ABC47-Z”, “100”, “STL”, “C”, “3”, “28”

Same data stream in XML…

```
<InventoryItem>
        <PartNum>ABC47-Z</PartNum>
        <Quantity>100</Quantity>
        <Warehouse>STL</Warehouse>
        <Zone>C</Zone>
        <Aisle>3</Aisle>
        <Bin>28</Bin>
</InventoryItem>
```

auction1.xml - Notepad

File Edit Format Help

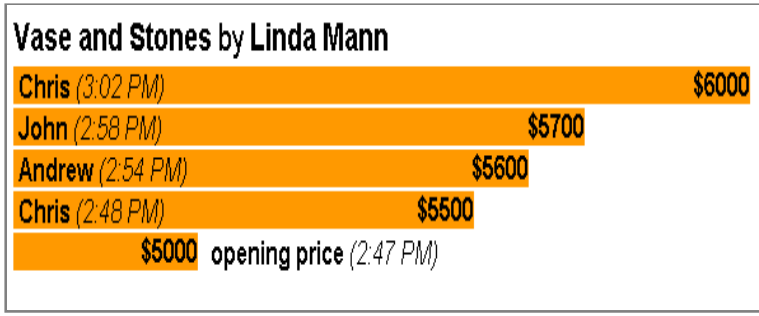
```
<?xml version="1.0"?>
<AUCTIONBLOCK>

  <ITEM>
    <TITLE>Vase and Stones</TITLE>
    <ARTIST>Linda Mann</ARTIST>
    <DIMENSIONS>20x30 inches</DIMENSIONS>
    <MATERIALS>Oil</MATERIALS>
    <YEAR>1996</YEAR>
    <DESCRIPTION>Still Life</DESCRIPTION>
    <PREVIEW-SMALL src="burl-s.jpg" width="300"
height="194" alt="Vase and Stones"/>
    <BIDS>
      <BID>
        <PRICE>6000</PRICE>
        <TIME>3:02:22 PM</TIME>
        <BIDDER>Chris</BIDDER>
        <TIMESTAMP>1307</TIMESTAMP>
      </BID>
      <BID>
        <PRICE>5700</PRICE>
        <TIME>2:58:42 PM</TIME>
        <BIDDER>John</BIDDER>
        <TIMESTAMP>1315</TIMESTAMP>
      </BID>
      <BID>
        <PRICE>5600</PRICE>
        <TIME>2:54:32 PM</TIME>
        <BIDDER>Andrew</BIDDER>
        <TIMESTAMP>1308</TIMESTAMP>
      </BID>
      <BID>
        <PRICE>5500</PRICE>
        <TIME>2:48:08 PM</TIME>
        <BIDDER>Chris</BIDDER>
        <TIMESTAMP>1307</TIMESTAMP>
      </BID>
      <BID>
        <PRICE>5000</PRICE>
        <TIME>2:47:58 PM</TIME>
        <BIDDER>opening price</BIDDER>
        <TIMESTAMP>1298</TIMESTAMP>
```

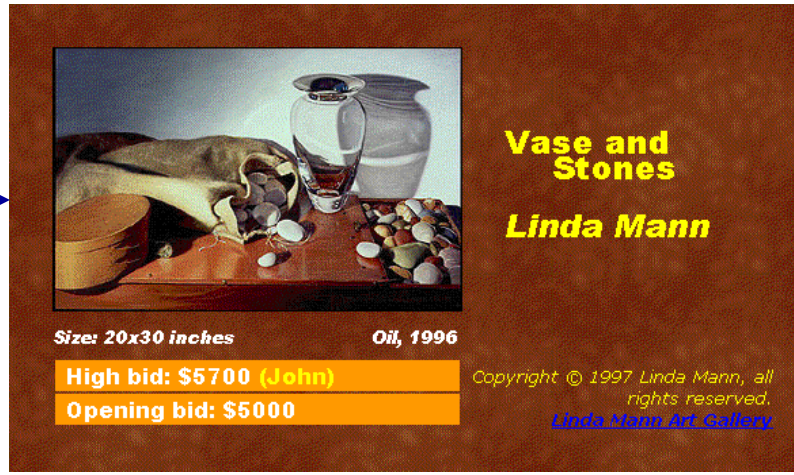
table.xsl

Price	Time	Bidder
$6000	3:02:22 PM	Chris
$5700	2:58:42 PM	John
$5600	2:54:32 PM	Andrew
$5500	2:48:08 PM	Chris
$5000	2:47:58 PM	opening price

bar.xsl


Vase and Stones by Linda Mann
Chris (3:02 PM) $6000
John (2:58 PM) $5700
Andrew (2:54 PM) $5600
Chris (2:48 PM) $5500
$5000 opening price (2:47 PM)

art.xsl



Information Availability

Anytime, Anywhere, Any Device

auction1.xml - Notepad

File Edit Format Help

```
<?xml version="1.0"?>
<AUCTIONBLOCK>

  <ITEM>
    <TITLE>Vase and Stones</TITLE>
    <ARTIST>Linda Mann</ARTIST>
    <DIMENSIONS>20x30 inches</DIMENSIONS>
    <MATERIALS>Oil</MATERIALS>
    <YEAR>1996</YEAR>
    <DESCRIPTION>Still Life</DESCRIPTION>
    <PREVIEW-SMALL src="burl-s.jpg" width="300
height="194" alt="Vase and Stones"/>
    <BIDS>
      <BID>
        <PRICE>6000</PRICE>
        <TIME>3:02:22 PM</TIME>
        <BIDDER>Chris</BIDDER>
        <TIMESTAMP>1307</TIMESTAMP>
      </BID>
      <BID>
        <PRICE>5700</PRICE>
        <TIME>2:58:42 PM</TIME>
        <BIDDER>John</BIDDER>
        <TIMESTAMP>1315</TIMESTAMP>
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        <TIMESTAMP>1307</TIMESTAMP>
      </BID>
      <BID>
        <PRICE>5000</PRICE>
        <TIME>2:47:58 PM</TIME>
        <BIDDER>opening price</BIDDER>
        <TIMESTAMP>1298</TIMESTAMP>
```
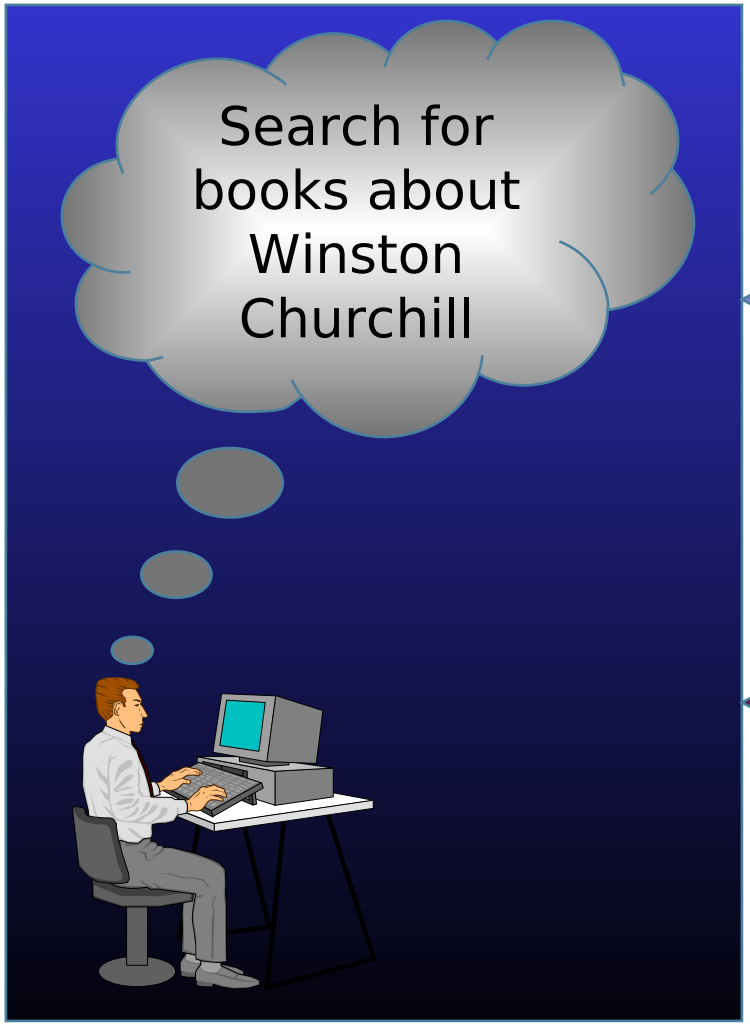

ie5.xsl
ie4.xsl
nav3.xsl

alcom.xsl
ppc.xsl

edi_x.xsl
ap_y.xsl
lat_z.xsl

Agents Mean More Meaningful Searches With XML



Without XML

- Books by Winston Churchill
- Books about Winston Churchill
- Rock band called Winston Churchill

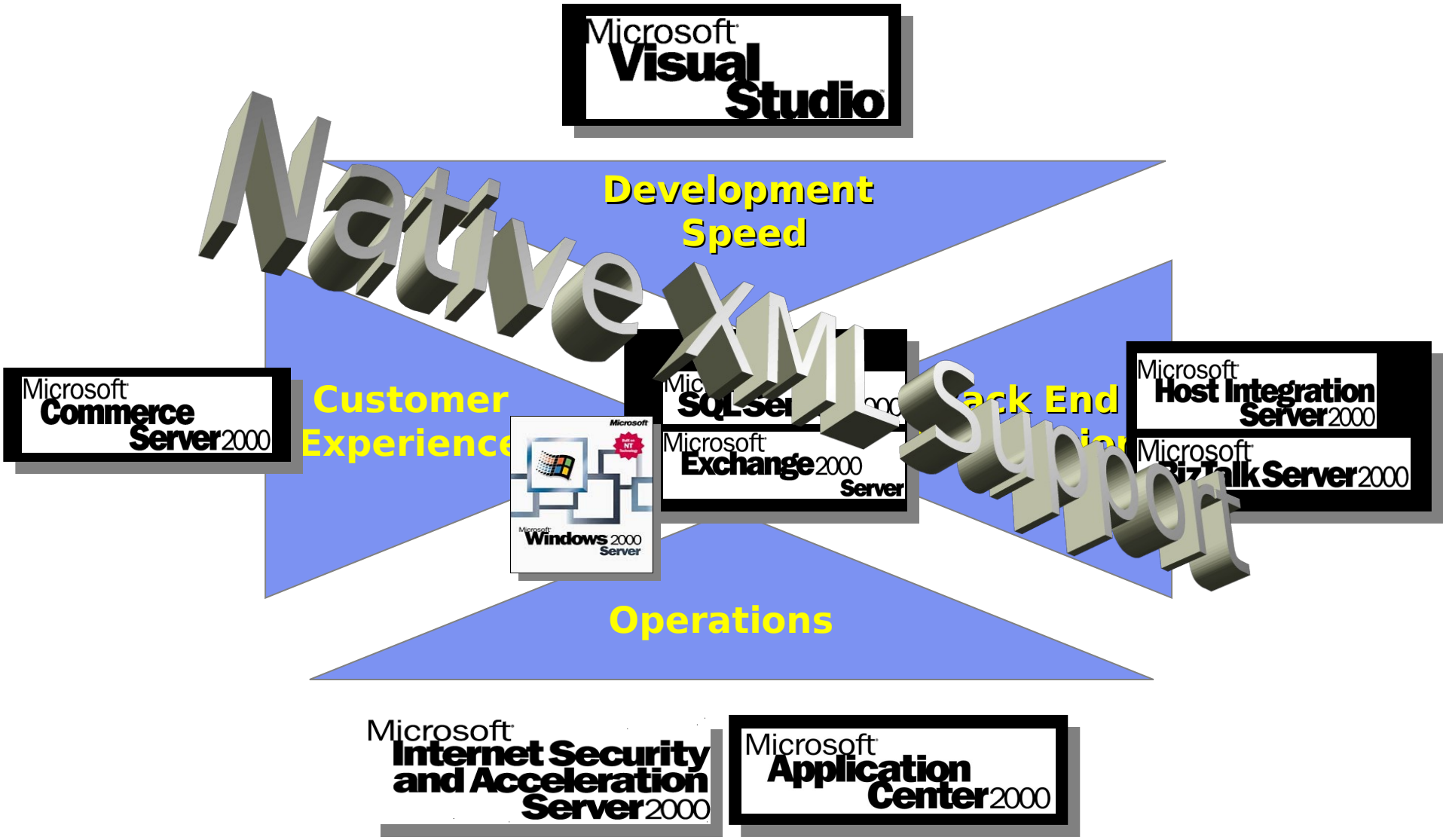
With XML

- Books about Winston Churchill

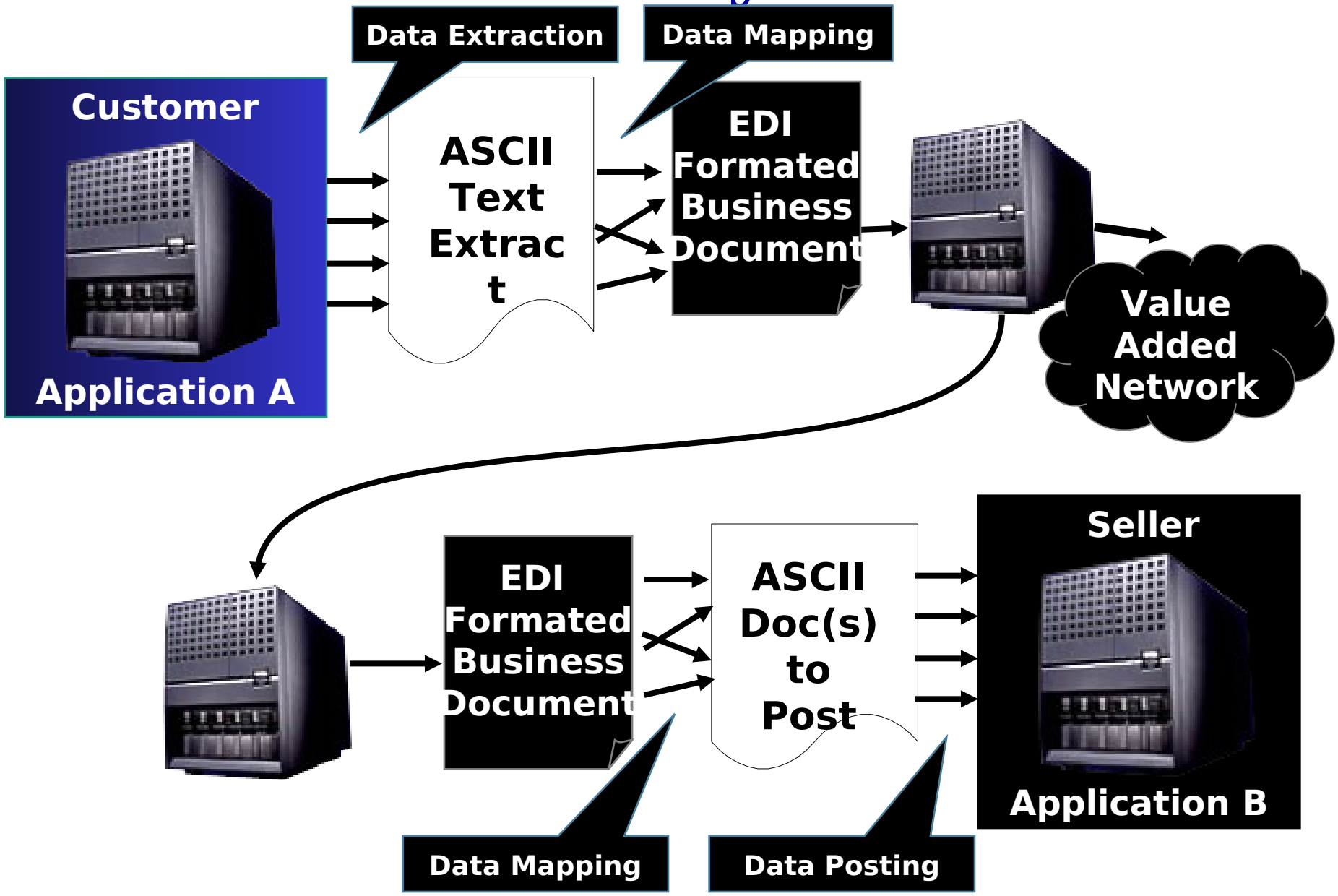
Web Services Examples

Location Services	**Maps, routing, nearby locations…**
Shopping Services	**Order tracking, supply chain, auctions, coupons…**
Information Services	**Headlines, weather, horoscopes, TV times…**
Communication Services	**Email, instant messages…**

.NET Platform



Business Process Integration Today



XML—The New Data Interchange Standard

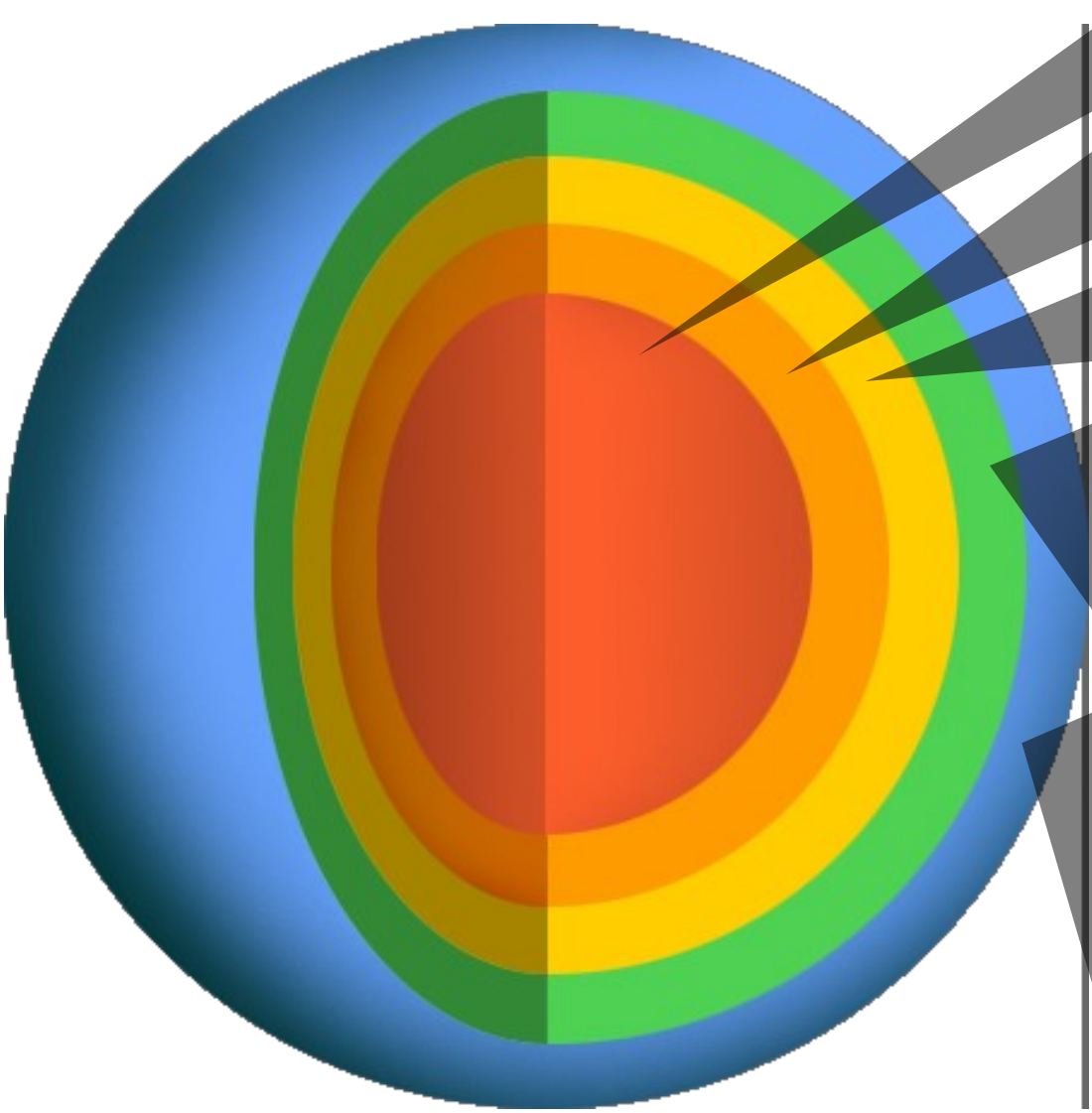
What Meta Says About EDI

- **“While EDI is a critical enabler for billions of dollars of interactions per year, it is not necessarily the strategic approach for enabling new types of interactions”**

- **“We do not believe EDI will go away… EDI will become merely one of numerous interaction enablers…which will also include XML, message brokers, and various Web-derived technologies.”**

Source: EDI Outsourcing Part 1, Meta Group, March 1999

XML Provides a Base For Solutions Built on Standards



W3C XML, XSL, etc.

BizTalk.org + other

BizTalk Framework

Implementation
Windows 2000
BizTalk Server 2000

Apps and Solutions

Customers
ISVs, MCSPs, Sis, etc.
MS Information Services
Microsoft Products

BizTalk.Org

- First open web schema library
- Tools to register/edit schemas and track use
- Automated notification of schema change
- 500+ 3rd party XML schemas
- 250+ registered organizations
- Current news

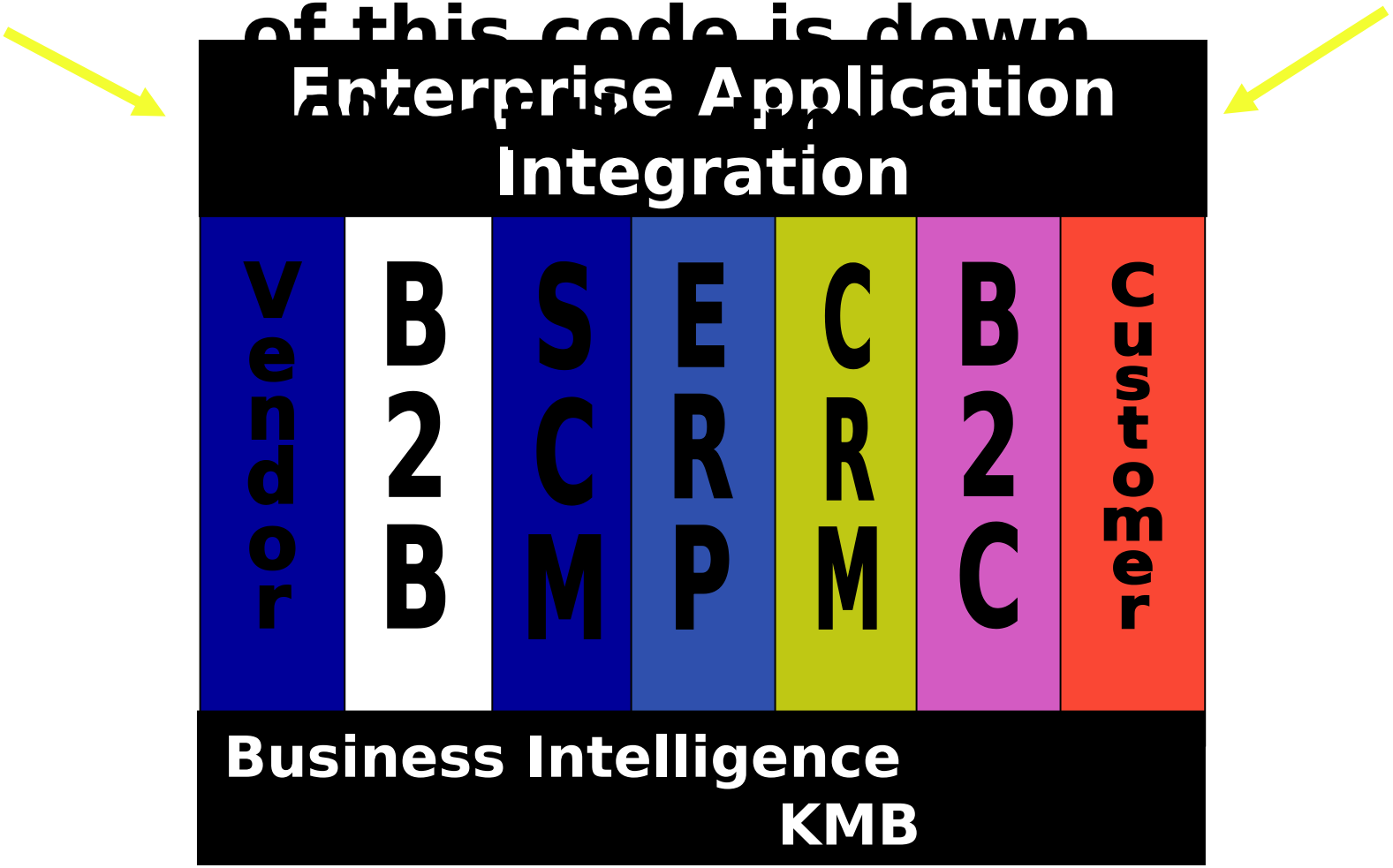
Welcome to BizTalk! - Microsoft Internet Explorer provided by ITG
File Edit View Favorites Tools Help
Address Links
BizTalk
Enabling Software to Speak the Language of Business
Spotlight on XML
Home Library Community News Resources Help
Quick Login
Login
Password
Login
Forgot your password?
New Users
Register Now
Visitor Home
Framework
Contacts
Legal
About BizTalk
Welcome to BizTalk.org
BizTalk is an industry initiative started by Microsoft and supported by a wide range of organizations, from technology vendors like SAP and CommerceOne to technology users like Boeing and BP/Amoco. BizTalk is not a standards body. Instead, we are a community of standards users with the goal of driving the rapid, consistent adoption of XML to enable electronic commerce and application integration.
We are defining the BizTalk Framework™, a set of guidelines for how to publish schemas in XML and how to use XML messages to easily integrate software programs together in order to build rich new solutions. Our design emphasis is to leverage what you have today - your existing data models, solutions, and application infrastructure - and adapt it for electronic commerce through the use of XML.
Through this Web site you can locate, manage, learn about, share information about and publish XML, XSL and information models and business processes supported by applications that support the BizTalk Framework. There's a library of XML schemas for you to review and download for use in your own applications. We even encourage you to publish your own schemas here for others to use! Membership is free, so why not sign up and start taking advantage of a public resource that is sure to keep you ahead of the game .
Internet

zTalk.Org Steering Committe

American Petroleum Institute	Intellysis
Ariba	I2
Baan	JD Edwards
BP/Amoco	Merrill Lynch
Boeing	Microsoft
Clarus	Open Applications Group
CommerceOne	Pivotal
Compaq	RosettaNet
Concur	SAP
Dell	Siebel Systems
DISA	UPS

B2B System Components

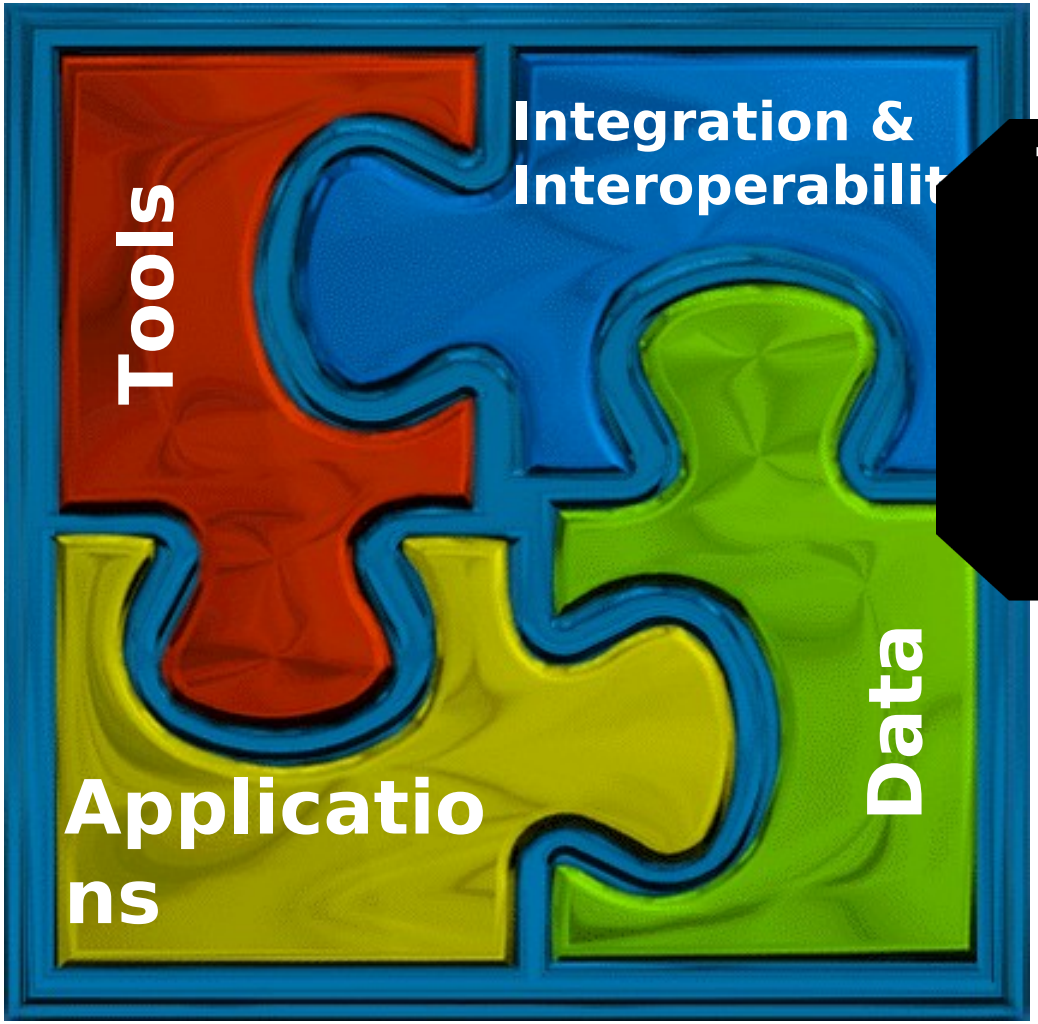
Gartner estimates 70% of this code is down



Solves Two Major Problems

- **Challenges**
  - **Information exchange within organization (Internal)**
    - **LOB application integration: Known as A2A or Application to Application**
  - **Information exchange outside the organization (External)**
    - **Business to Business (B2B) or Business to consumer (B2C), Government to Government (G2G)**
  - **There are different and somewhat distinct success factors for each challenge**

The BizTalk Initiative



The BizTalk Initiative

—

Making it easier to integrate and interoperate business processes

Windows DNA Comprehensive Platform

BizTalk Early Adopters

The BizTalk Server Solution

- **Business to Consumer (B2C)**
- **Business to Business (B2B)**
- **E-Procurement applications**
- **Supply chain automation**
- **E-trading hubs and E-market places**
- **Internal Business Process Integration**

BizTalk Server 2000
Primary Benefits

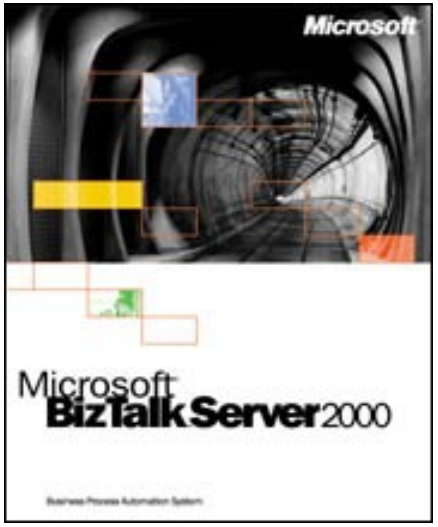
- ***Complexity Made Simple***
  Easily build, manage and track distributed business processes that cross organizations, applications and people
- ***Fastest Time to Market***
  Quickly establish reliable, secure B2B trading relationships with customers and key partners over the Internet
- ***Leverage existing IT investments***
  Cost effectively integrate disparate legacy applications independent of platform

Process Orchestration

BizTalk Orchestration

BizTalk Messaging

Internet / Intranet / VAN



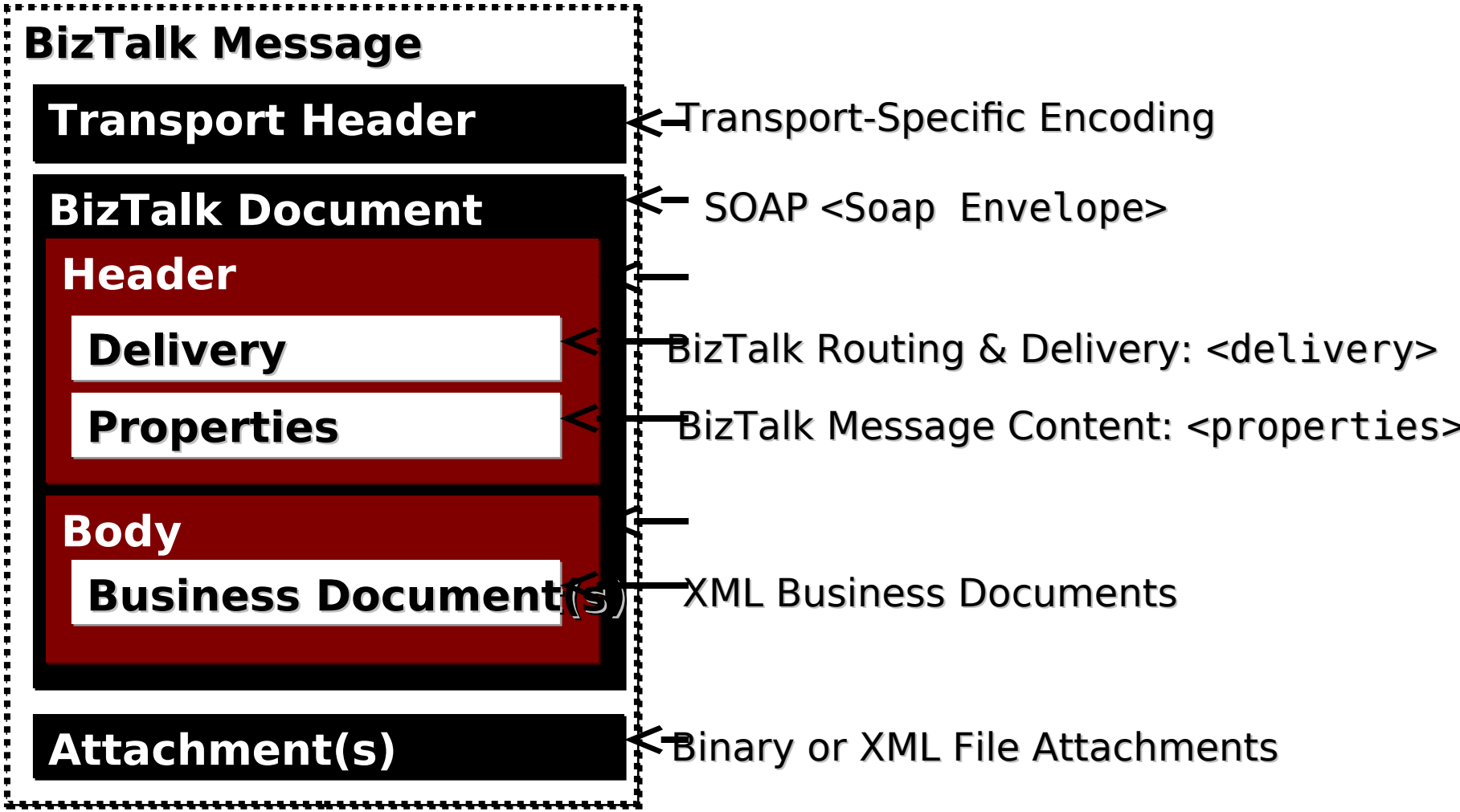
BizTalk Framework

- **Built on W3C XML standards and activities**
- **Provides implementation guidelines for XML-based document routing**
- **Supports SOAP 1.1 for open, standards-based messaging**
- **Includes multi-part MIME support for business document attachments**
- **Includes reliable messaging protocol support for exactly once delivery**
- **Supported in Microsoft BizTalk Server 2000**
  as interoperability specification
- **Availability of industry-specific SDKs**

BizTalk Framework 2.0 Defines:

- The overall structure of business documents
- BizTalk headers for document routing, tracking, description, process management, and reliable delivery
- The handling of BizTalk documents that require reliable delivery

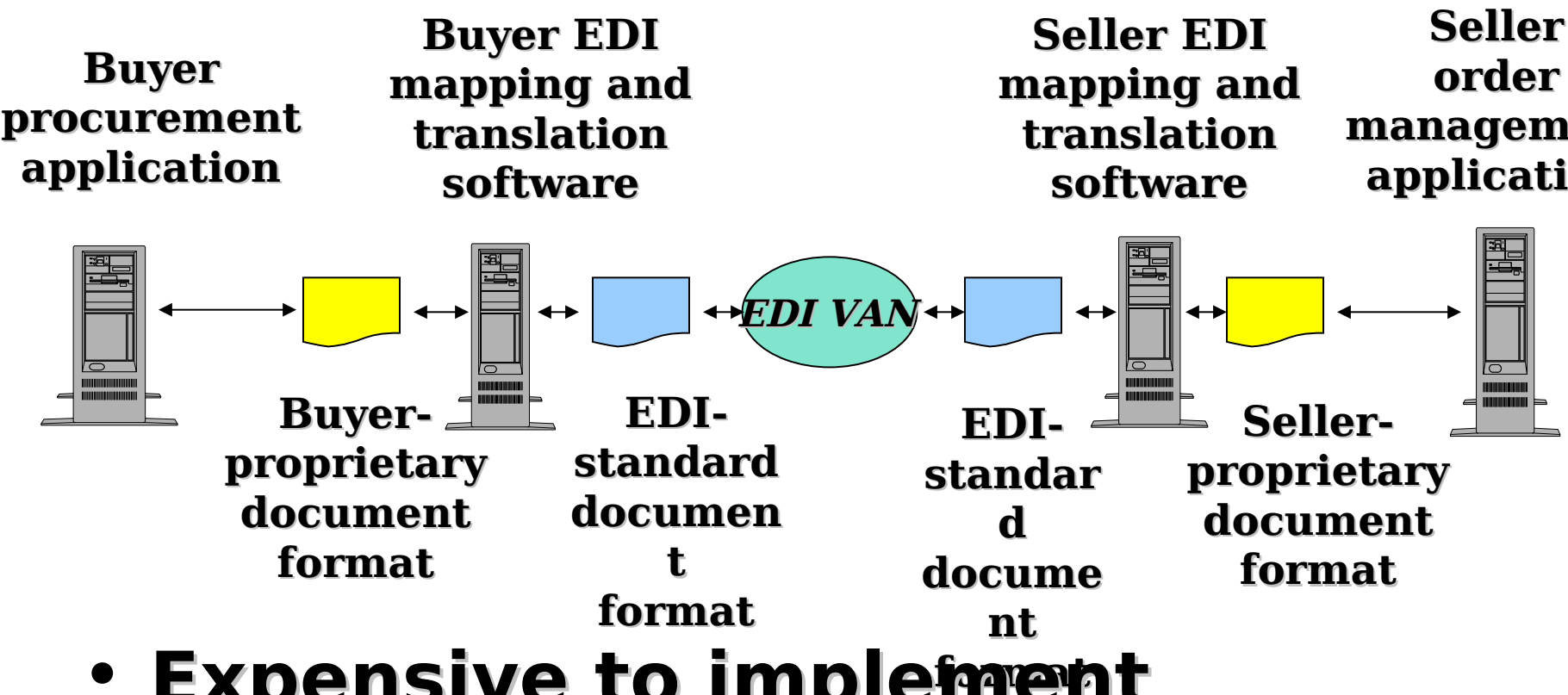
BizTalk Document Structure



BizTalk Server Key Features

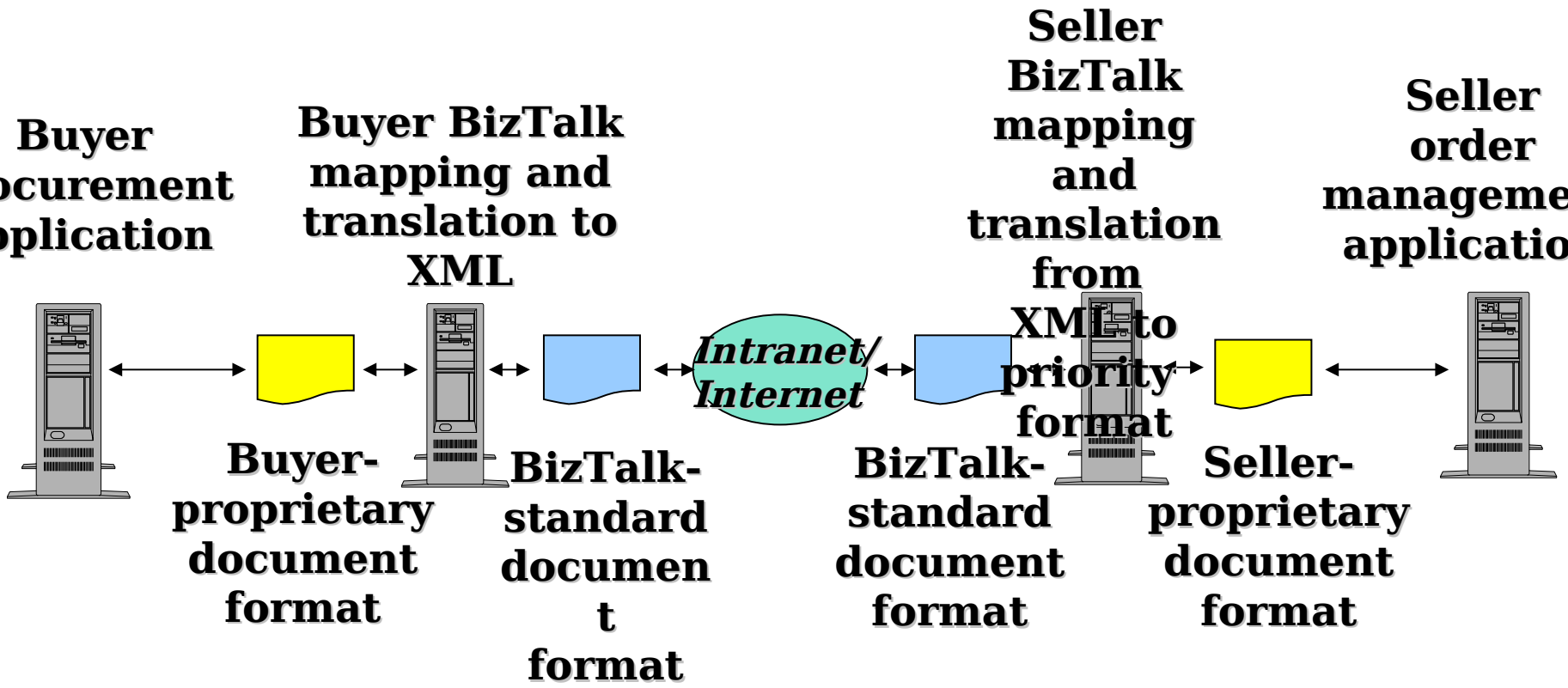
- Application and Trading Partner Management
  - Agreements
  - Ports and Channels
- Document Translation
  - Focus on XML
  - EDI: X12 and EDIFACT
  - Flat Files: Delimited/Positional
  - SAP Idoc
- Reliable, secure B2B data interchange over the Web
- Reliable Document Routing and Delivery
  - Direct Integration:
    - Synchronous and Asynchronous
  - Multiple Transport Protocols:
    - HTTP, HTTP/S, SMTP, DCOM, File, FTP, MSMQ, Fax
- Provides a visual orchestration environment to quickly design, create, and manage distributed business processes
- Document Tracking and Activity Logging

pical End-to-End EDI Configurati



- Expensive to implement
- Limited to large companies
- Many formats within EDI (ANSI X12)

pical BizTalk Server Configurati


Buyer procurement application
Buyer BizTalk mapping and translation to XML
Seller BizTalk mapping and translation from XML to priority format
Seller order management application
Intranet/ Internet
Buyer-proprietary document format
BizTalk-standard document format
BizTalk-standard document format
Seller-proprietary document format

- Mapping priority formats to XML
- Solution for all sizes of companies
- Cost effective, highly versatile, easy to change, quick to implement

Live BizTalk Demo

Customers

Partners

Phone

Wireless Pocket PC

Worldwide Retailer

Commerce Server Windows 2000

BizTalk Server Windows 2000

External vendors and backend systems

SQL Server Windows 2000

JDEdwards

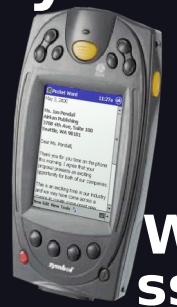
Order processing and Financials

i2

Supply Chain Planning

McHUGH SOFTWARE INTERNATIONAL

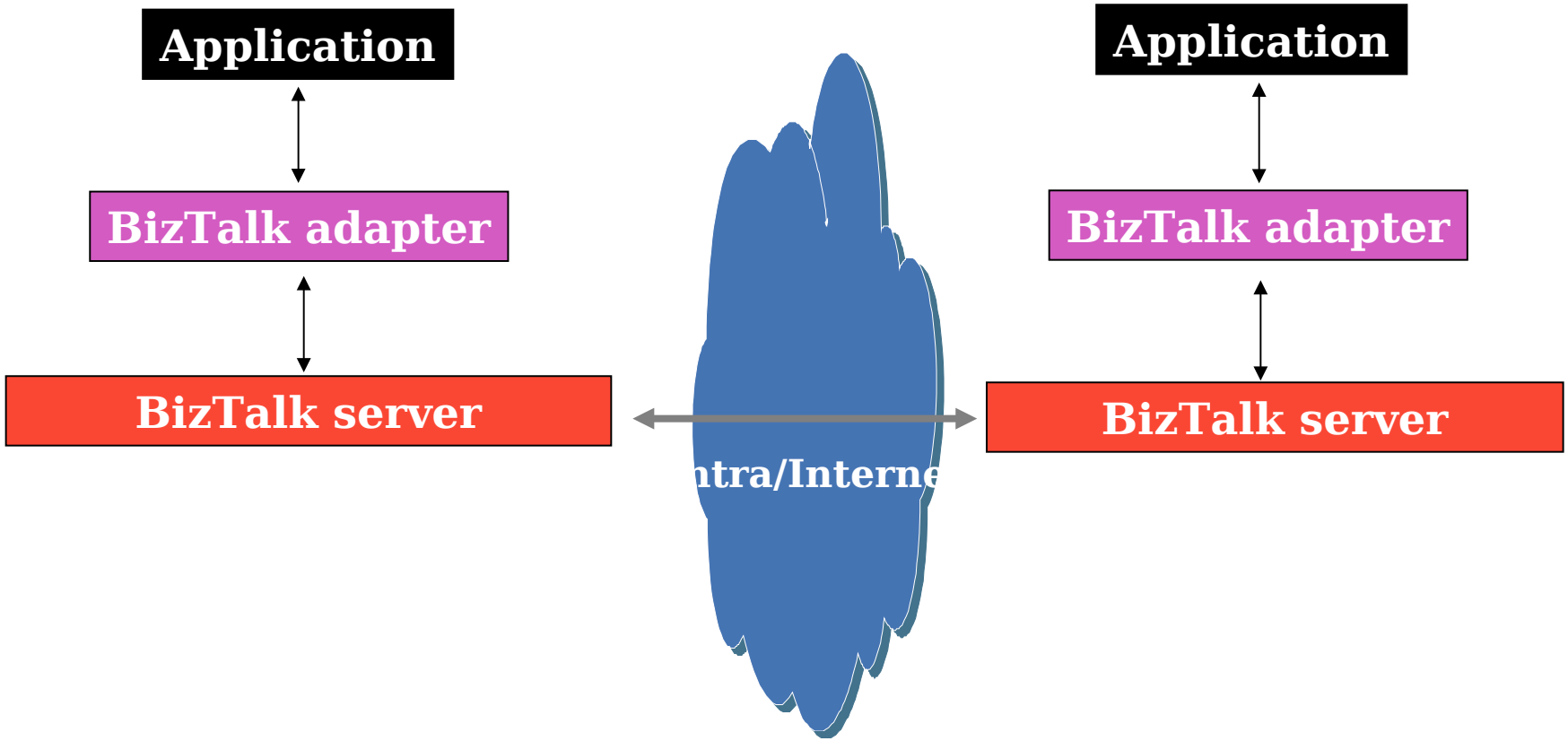
Inventory Mgt. system



bSQUARE

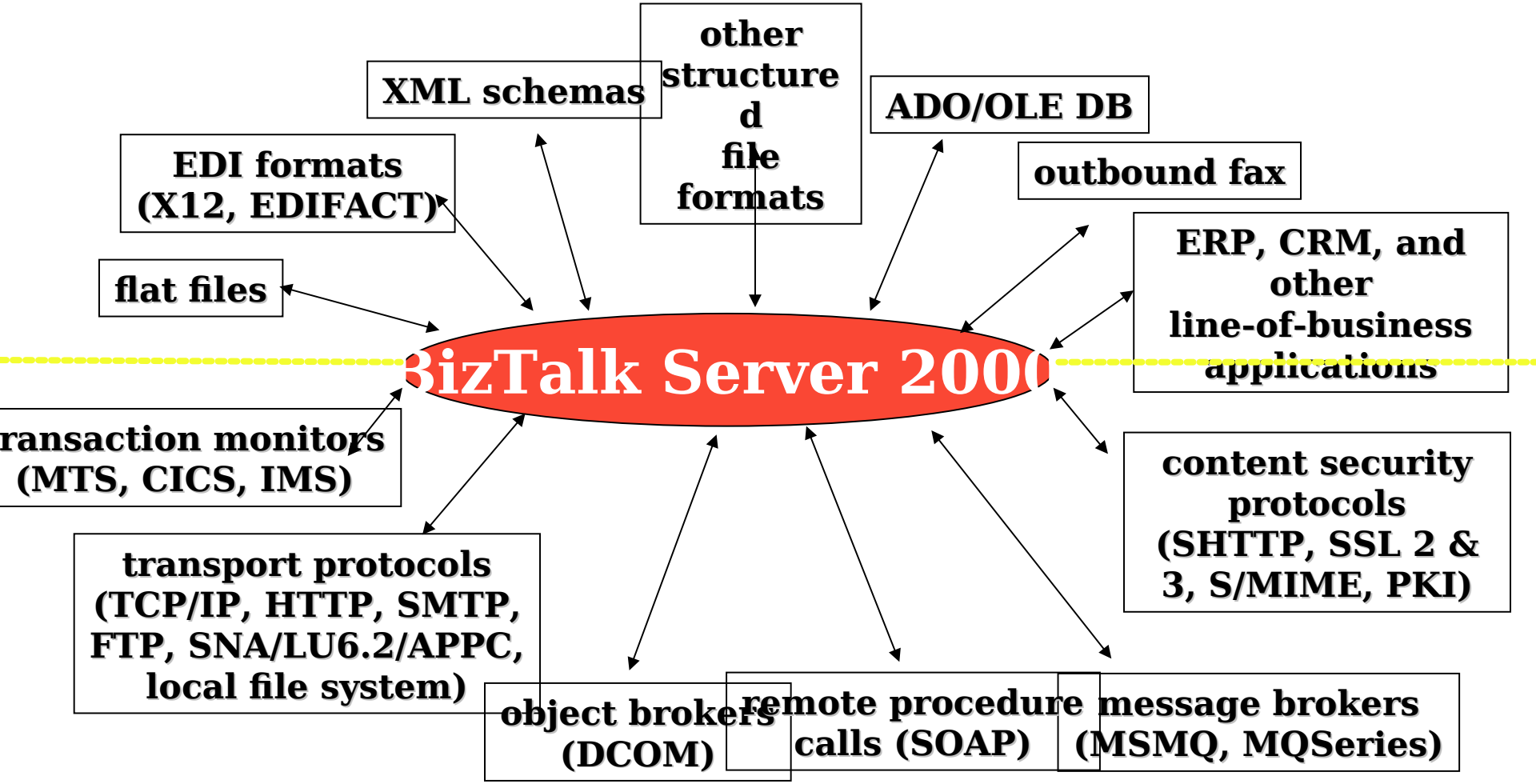
Wireless PDA

BizTalk Application Model



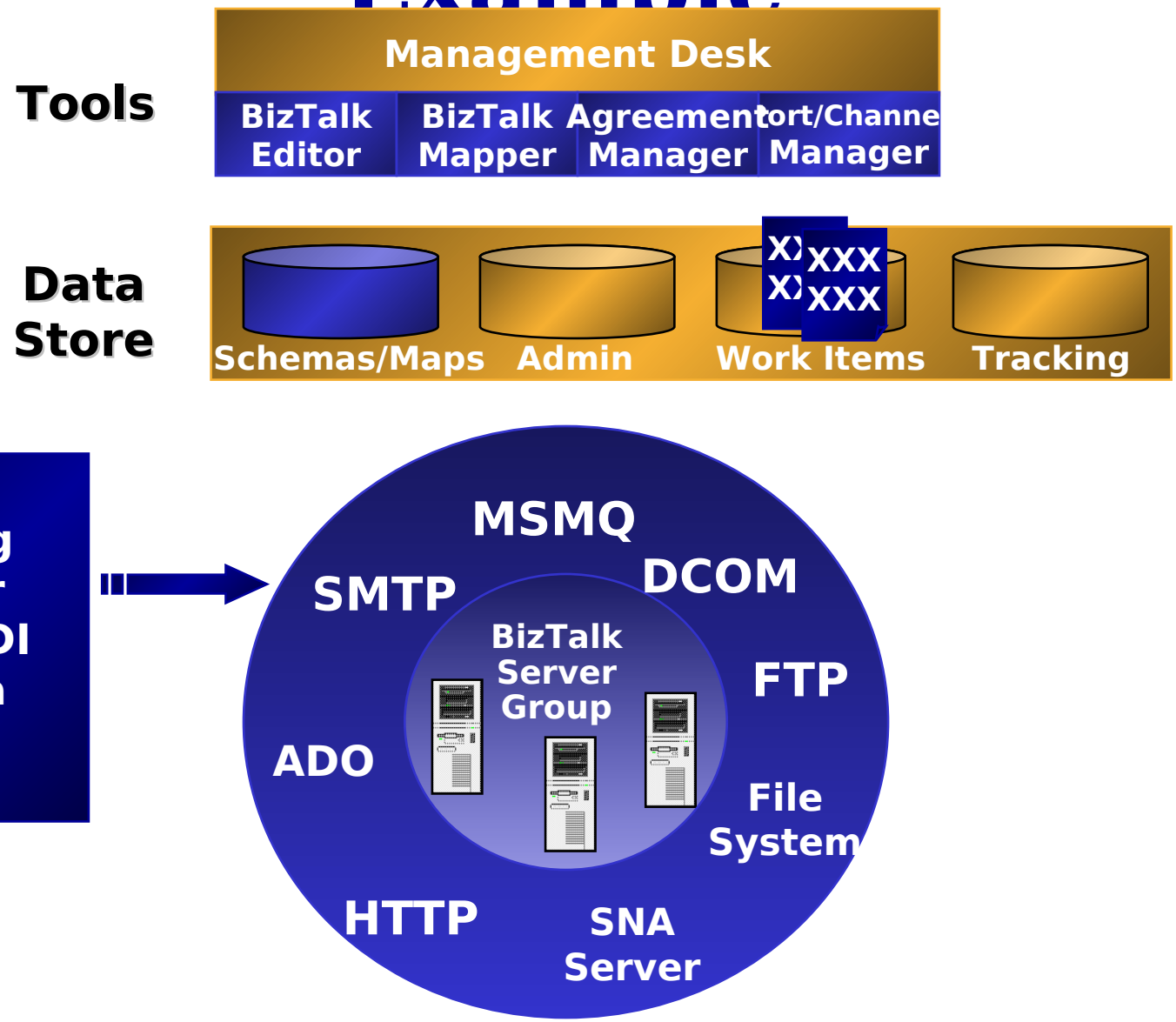
zTalk Server 2000 Remote Application Connect

Content Connectors


other structured file formats
XML schemas
ADO/OLE DB
EDI formats (X12, EDIFACT)
outbound fax
flat files
ERP, CRM, and other line-of-business applications
BizTalk Server 2000
ransaction monitors (MTS, CICS, IMS)
content security protocols (SHTTP, SSL 2 & 3, S/MIME, PKI)
transport protocols (TCP/IP, HTTP, SMTP, FTP, SNA/LU6.2/APPC, local file system)
object brokers (DCOM)
remote procedure calls (SOAP)
message brokers (MSMQ, MQSeries)

Middleware Connectors

Document Interchange Example

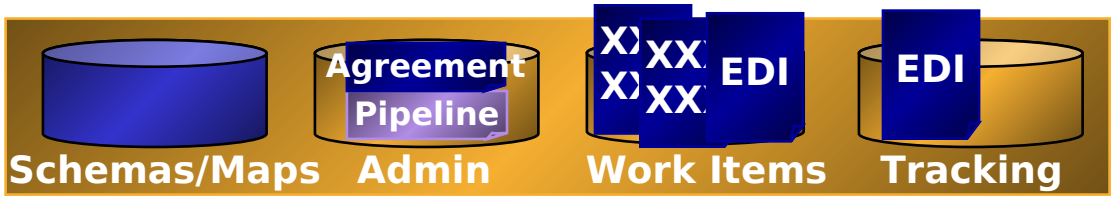


Document Interchange Example

Steps

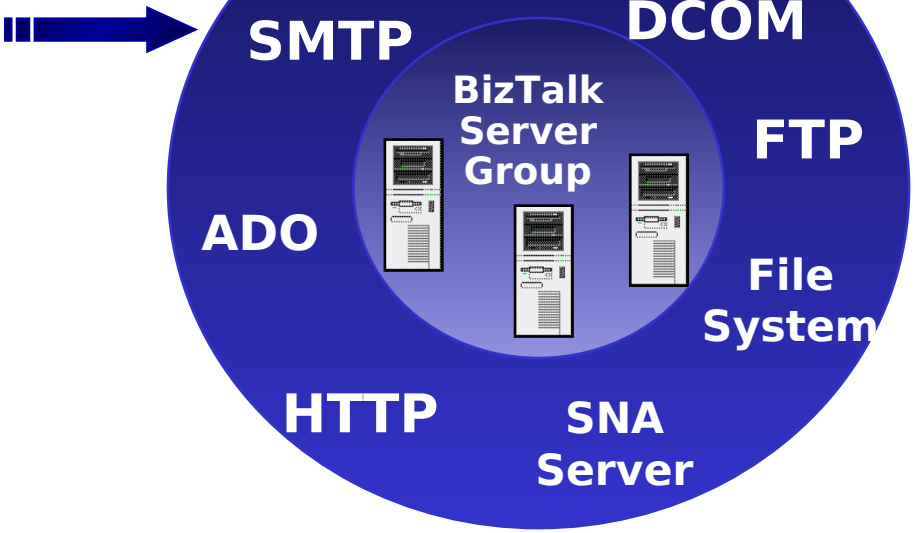
- ✓ **Check for an agreement**

Tools



Data Store

Trading Partner sends EDI doc via SMTP



Document Agreement

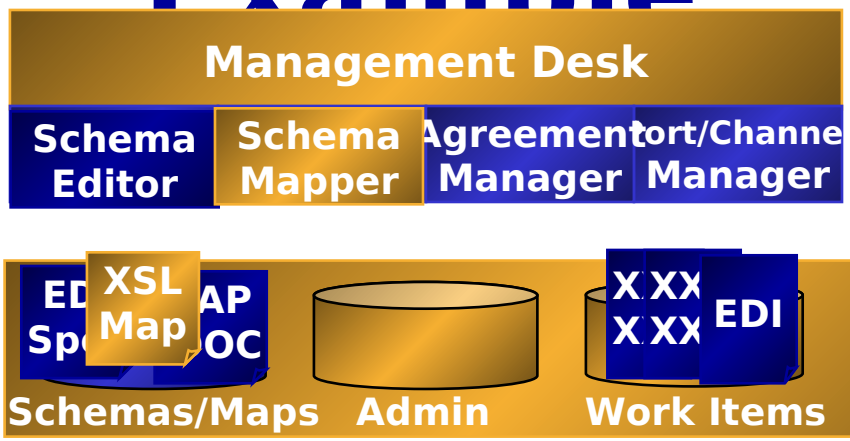
- **Before you can process the documents you need to know**
  - **Where did the document come from?**
  - **Can the authenticity of the document be verified?**
  - **Does the document conform to the format that the sender says it should?**
  - **What is the documents purpose?**
  - **Who is the document intended for?**
  - **Is the document urgent? Does it require immediate attention?**
  - **If valid, process the document**

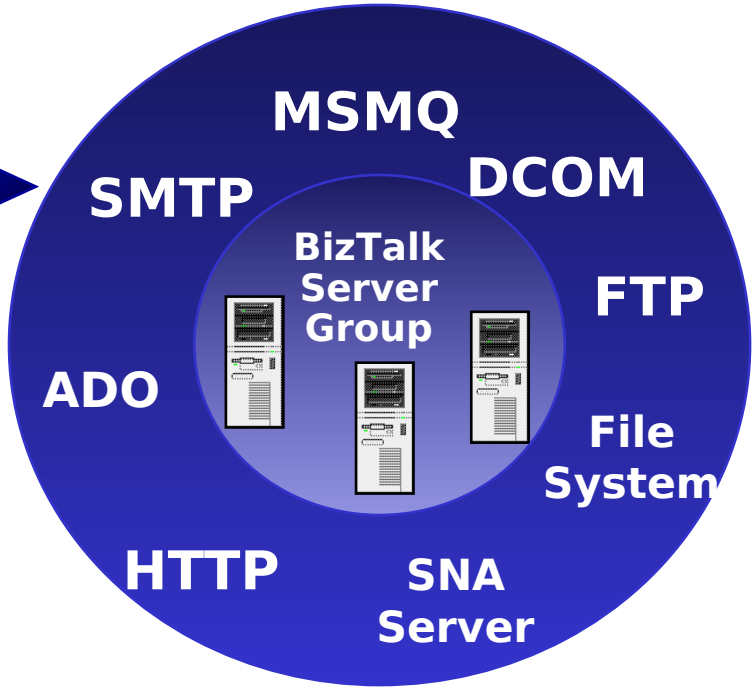
Document Interchange Example

Steps

- ✓ **Check for an agreement**
- ✓ **Convert EDI to XML, apply XSL Mapping, convert to SAP IDOC**

Trading Partner sends EDI doc via SMTP

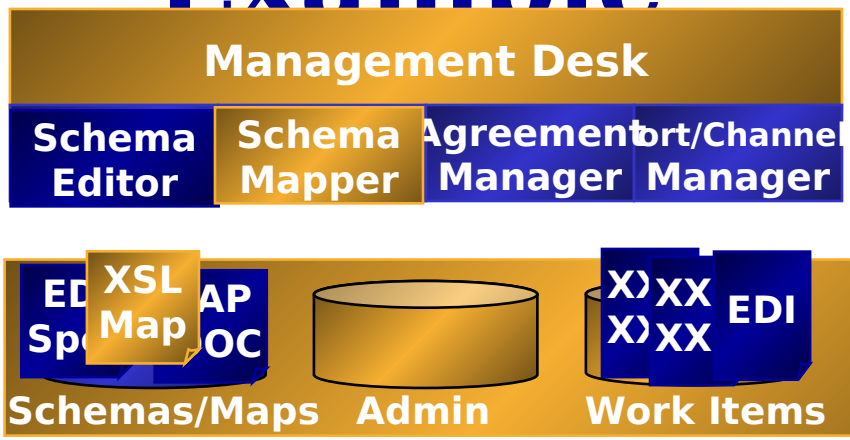




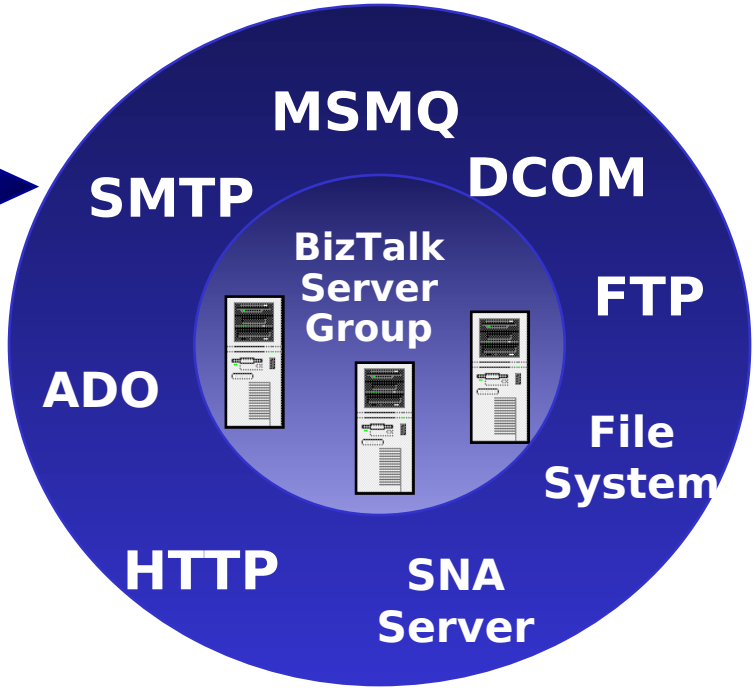
Document Interchange Example

Steps

- ✓ **Check for an agreement**
- ✓ **Convert EDI to XML, apply XSL Mapping, convert to SAP IDOC**
- ✓ **Send doc to SAP Partner via FTP**

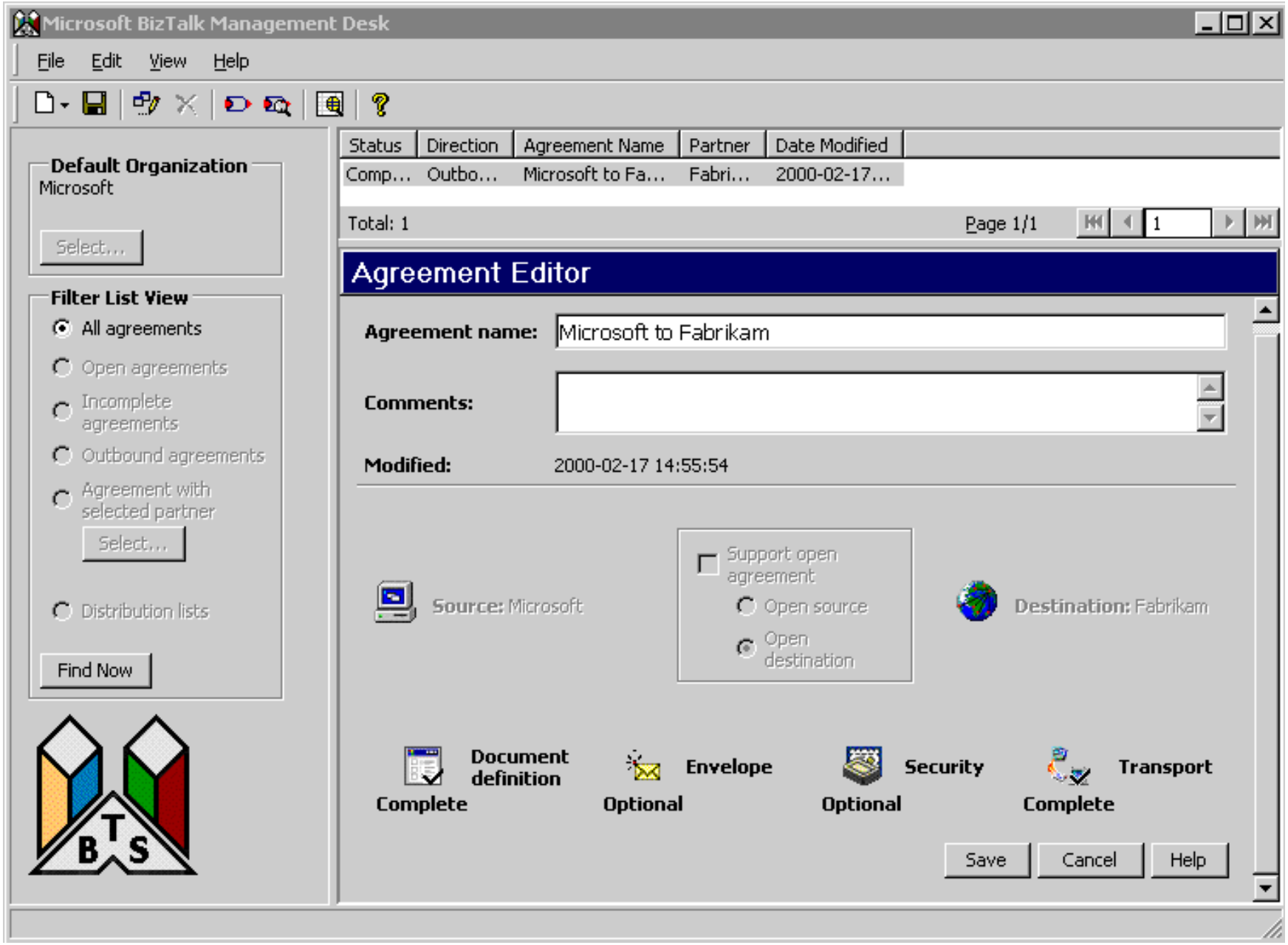


Trading Partner sends EDI doc via SMTP



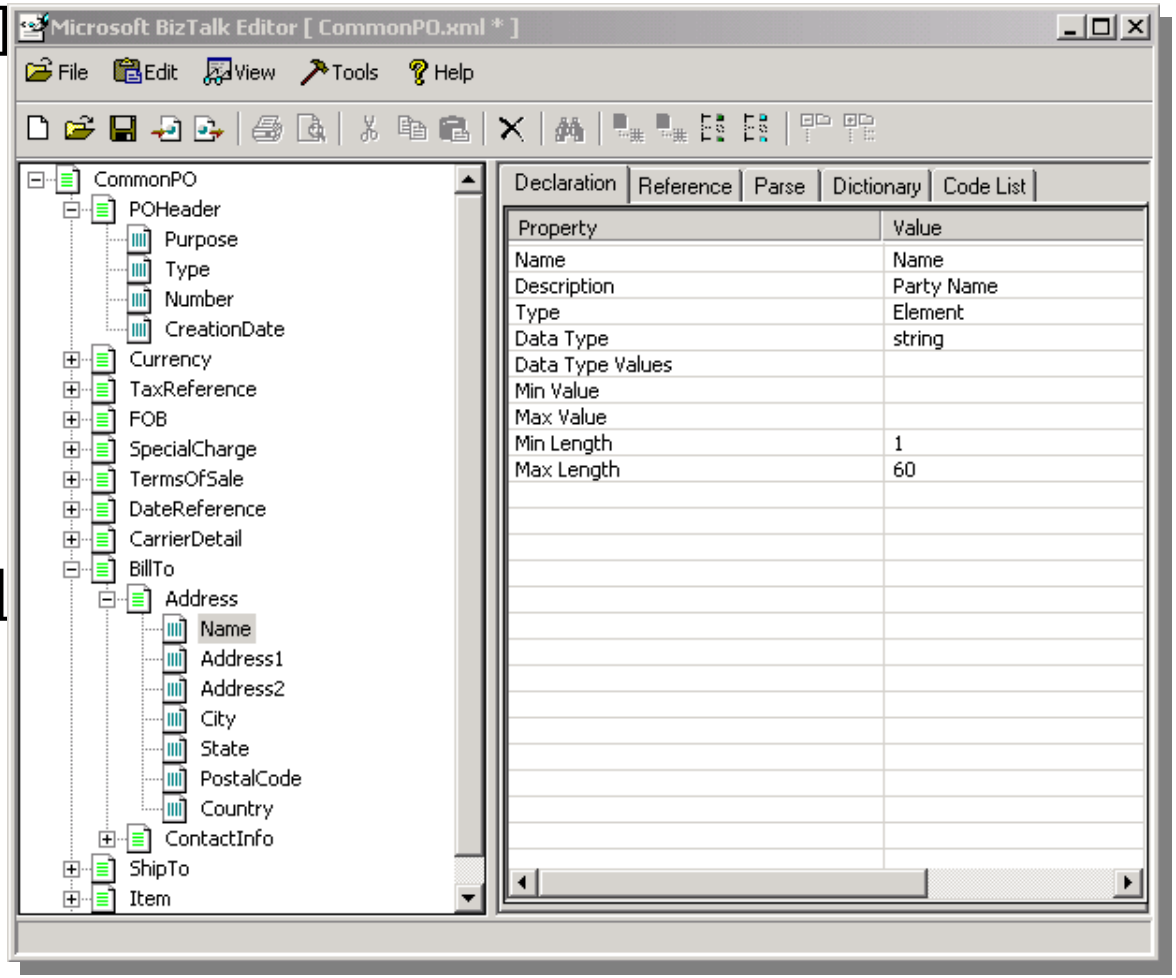
SAP R/3 IDOC sent Via FTP

Talk Management Desk's Agreement Ed



BizTalk Editor

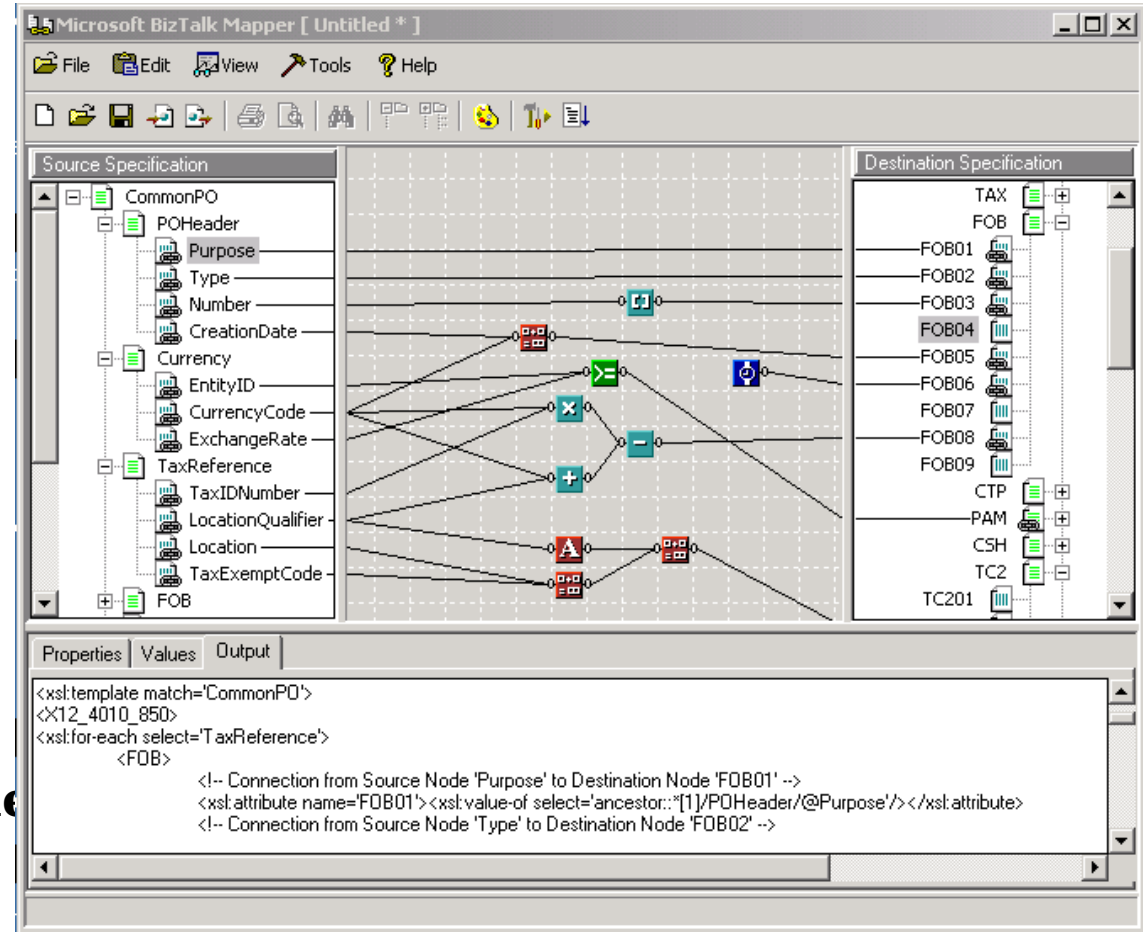
- Define business document structures
- Generates BizTalk XDR syntax
- XML/Non-XML
  - EDI
  - Flat files
    - Delimited
    - Positional
- Document Templates
- Import Modul
  - WF-XML
  - DTD
  - XDR Schema



BizTalk Schema Mapping

BizTalk Mapper

- XSLT Generator Component
- Create Maps
  - Published open format
- Schema Driven
- Extensible
  - Functoids
    - Canned
    - User-Configurable
    - Script
    - BYOF
- Rich Mapping Zone



BizTalk Mapper Features

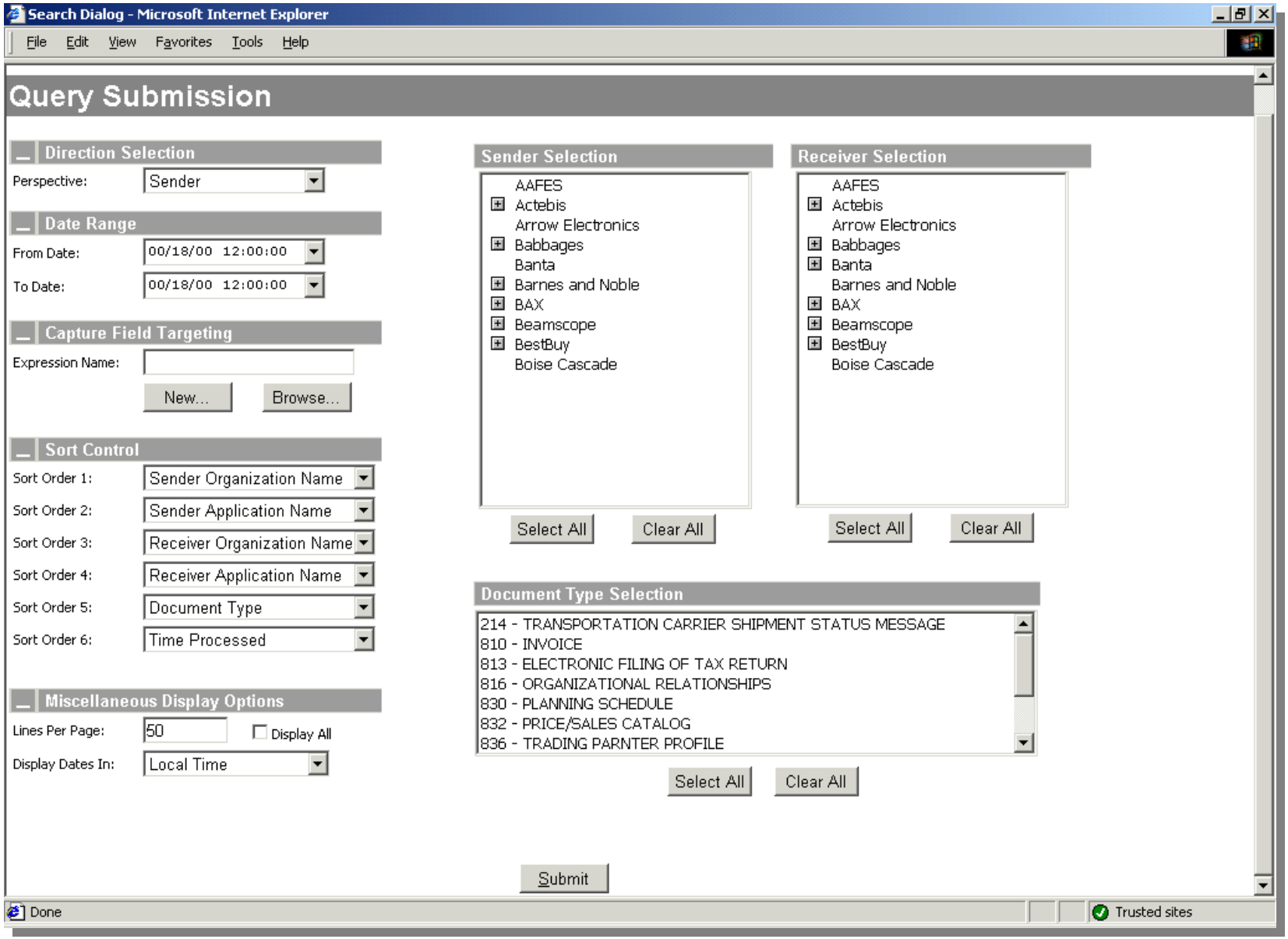
- **Rich Mapping Zone**
  - **Links, Functoids, Cascaded functoids, Constants**
- **Property list previews**
- **Functoid Pallette**
  - **Pre-Canned Functoid**
  - **Custom Functoids**
- **Published Map Source Format**
- **Intelligent XSLT Compiler Component**
- **Map Debugging**
  - **Test Map at design time**
- **Schema Updates in Mapper**

BizTalk Mapper Functoids

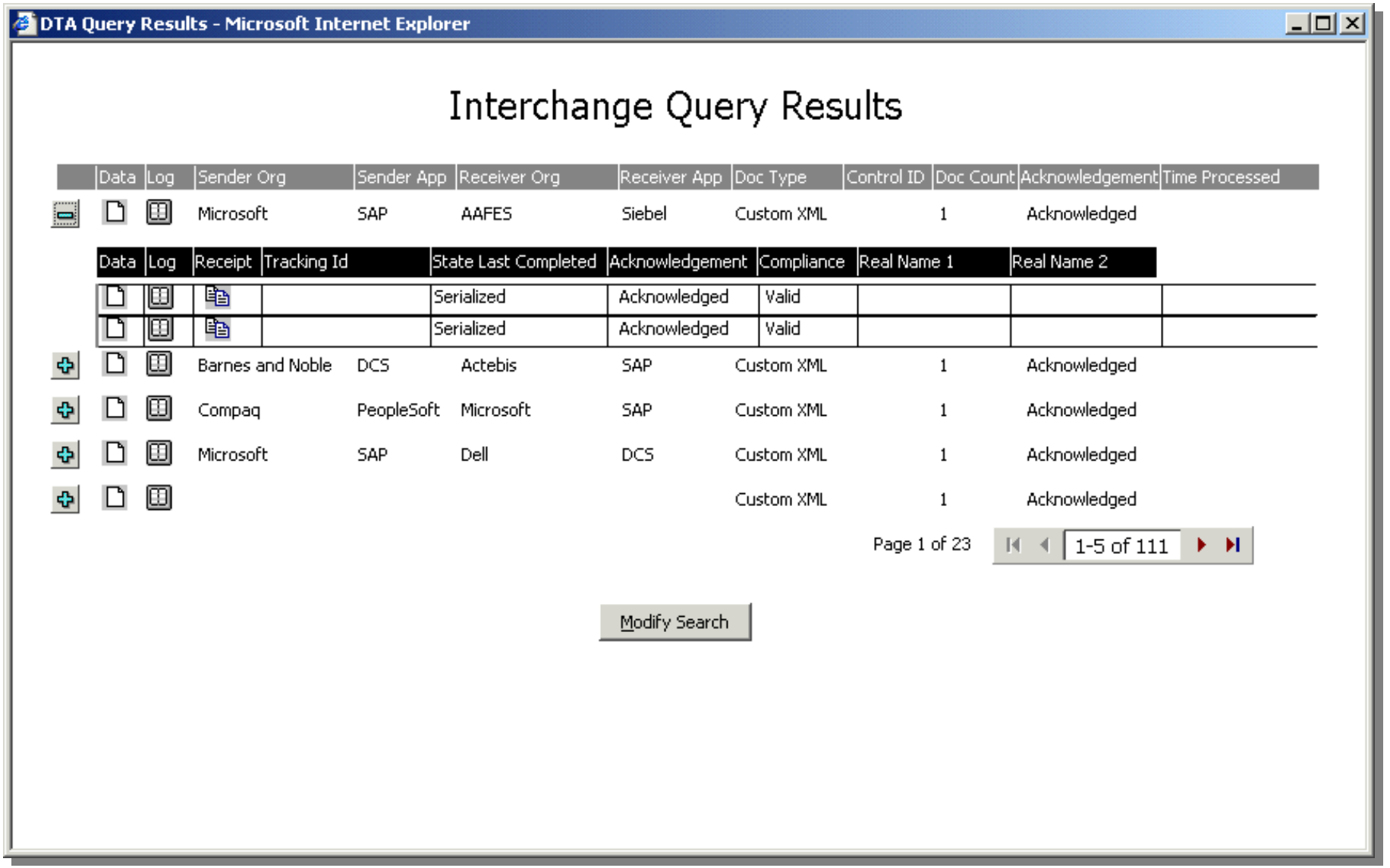
- String
- Mathematical
- Date/Time
- Logical
- Scientific
- Conversion
- Cumulative
- Database/Lookup
- Advanced
  - Script
  - BYOF
  - Recursive Looping

- Variable # of inputs
- Property Sheets
- Re-order Inputs
- Script preview

Document Tracking



Document Tracking


DTA Query Results - Microsoft Internet Explorer
Interchange Query Results
Data Log Sender Org Sender App Receiver Org Receiver App Doc Type Control ID Doc Count Acknowledgement Time Processed
Microsoft SAP AAFES Siebel Custom XML 1 Acknowledged
Data Log Receipt Tracking Id State Last Completed Acknowledgement Compliance Real Name 1 Real Name 2
Serialized Acknowledged Valid
Serialized Acknowledged Valid
Barnes and Noble DCS Actebis SAP Custom XML 1 Acknowledged
Compaq PeopleSoft Microsoft SAP Custom XML 1 Acknowledged
Microsoft SAP Dell DCS Custom XML 1 Acknowledged
Custom XML 1 Acknowledged
Page 1 of 23
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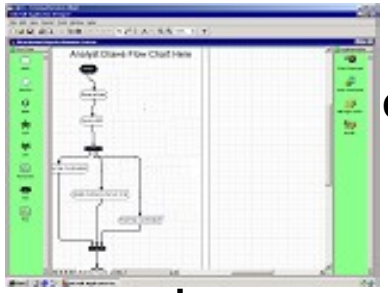
Modify Search

Orchestration of Business Processes

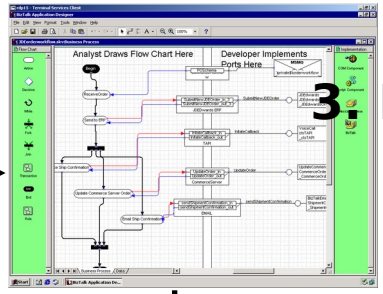
- **Orchestration is about building process that span time, organizations, applications, and people both behind the firewall and across the Internet**
- **Orchestration has three broad requirements**
  - **Separation of definition from implementation**
  - **Dynamic processes**
  - **“Any to any” integration**

Orchestration Process

Business Analyst defines the business process



eveloper maps business definitions to software compone



3. BizTalk generates the orchestration code

<XLANG> Process </XLANG>

Internal Applications

Internal Applications

COM

BizTalk Orchestration Engine

BizTalk Transform/ Routing Engine

MSMQ

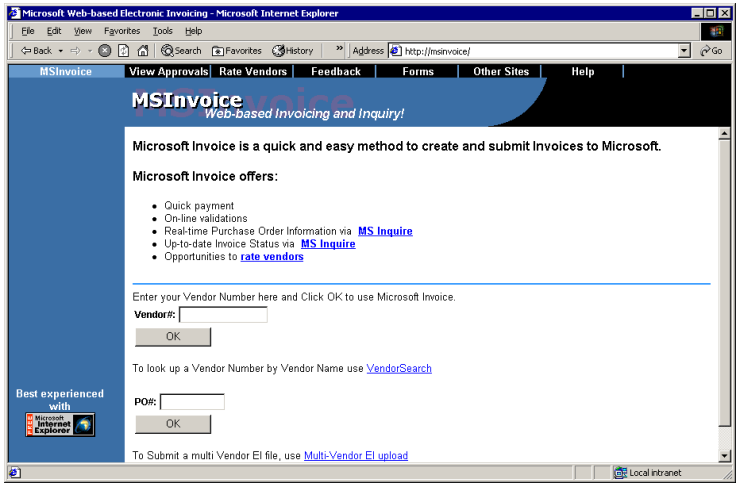
Internet

Web Service

Web Service

B2B Trading Partners

BizTalk at Microsoft


Microsoft Web-based Electronic Invoicing - Microsoft Internet Explorer
MSInvoice
View Approvals
Rate Vendors
Feedback
Forms
Other Sites
Help
MSInvoice
Web-based Invoicing and Inquiry!
Microsoft Invoice is a quick and easy method to create and submit Invoices to Microsoft.
Microsoft Invoice offers:
Enter your Vendor Number here and Click OK to use Microsoft Invoice.
To look up a Vendor Number by Vendor Name use VendorSearch
To Submit a multi Vendor EI file, use Multi-Vendor EI upload

Employees

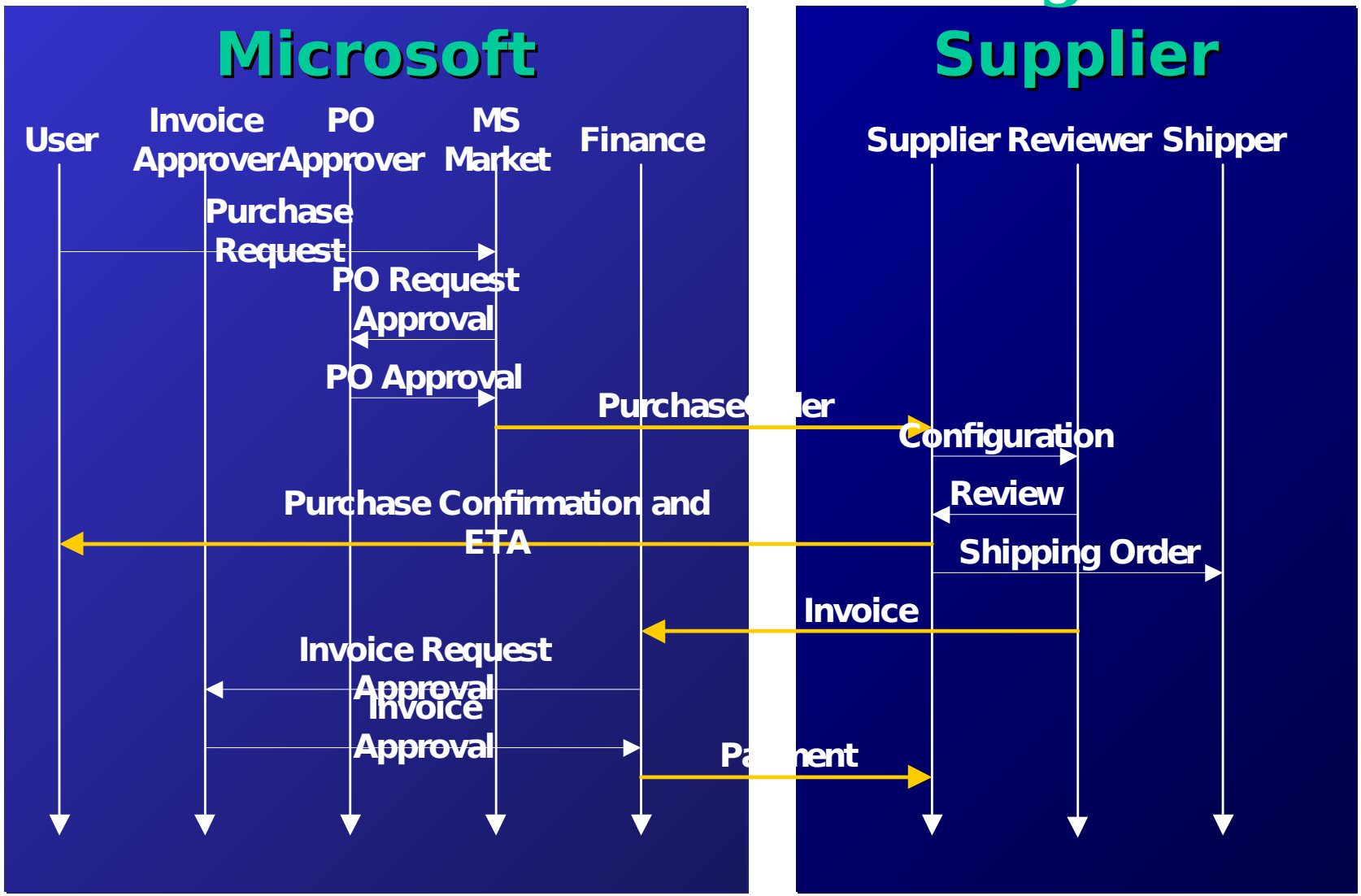
- 19,500 users, 6,000+ orders per week
- 99.8% of all requisitions in US
- Transaction volume - $4.3 billion
- Used in 46 countries
- 26 FTE's saved worldwide
- Worldwide support 1.5 FTE's
- Transaction costs reduced from $60 to $4 per order

Suppliers

- 827 vendors, 3,000 invoices per week
- 93% of all US invoices
- Targeted transaction volume - $4.0 billion
- 600 Suppliers using internet
- Increased productivity from 4,400 docs per head per year to 50,000; 22 FTE's saved in US

Scenario : Microsoft Market

Business-to-Business Integration



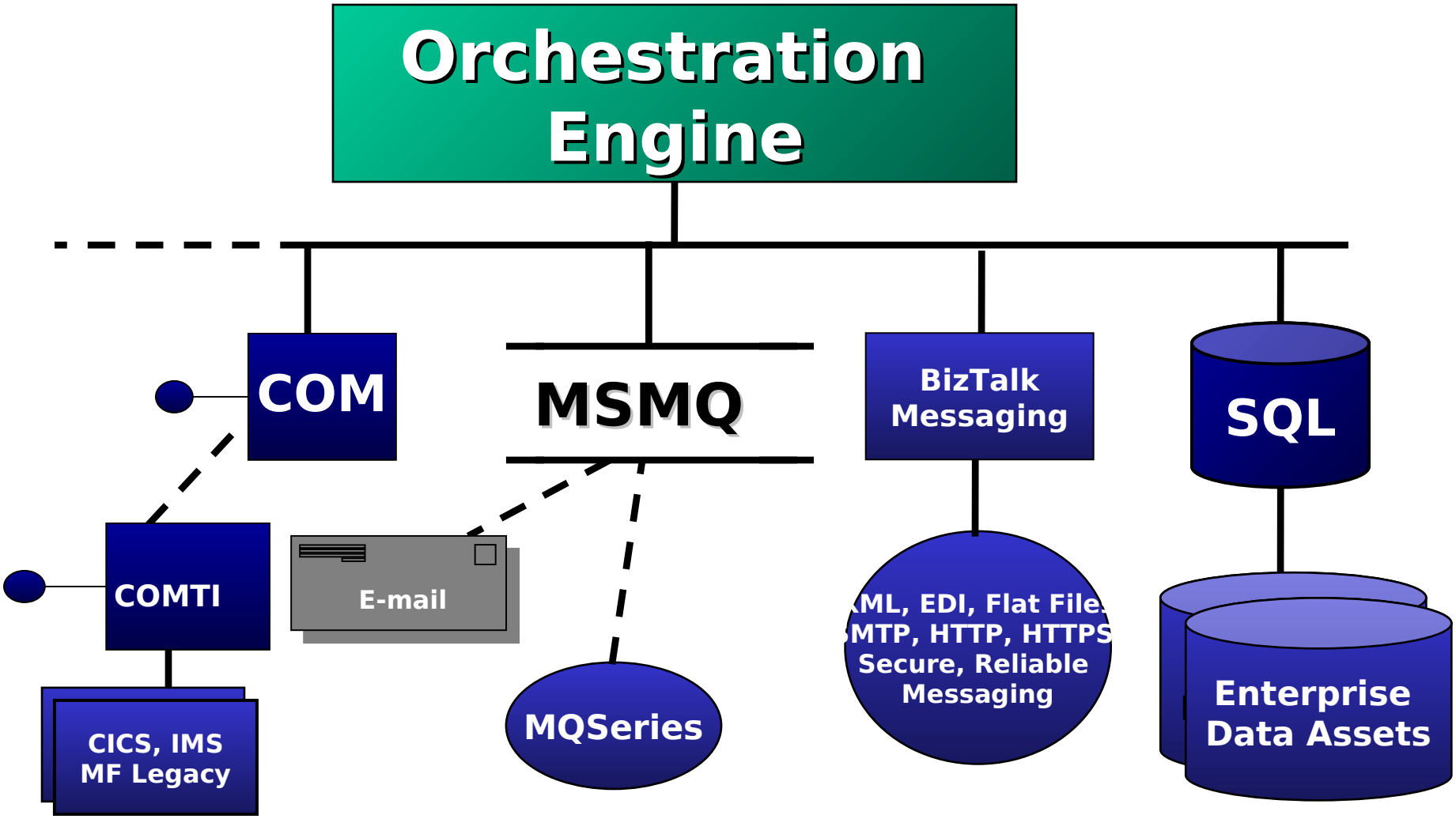
BizTalk Orchestration

Features Overview

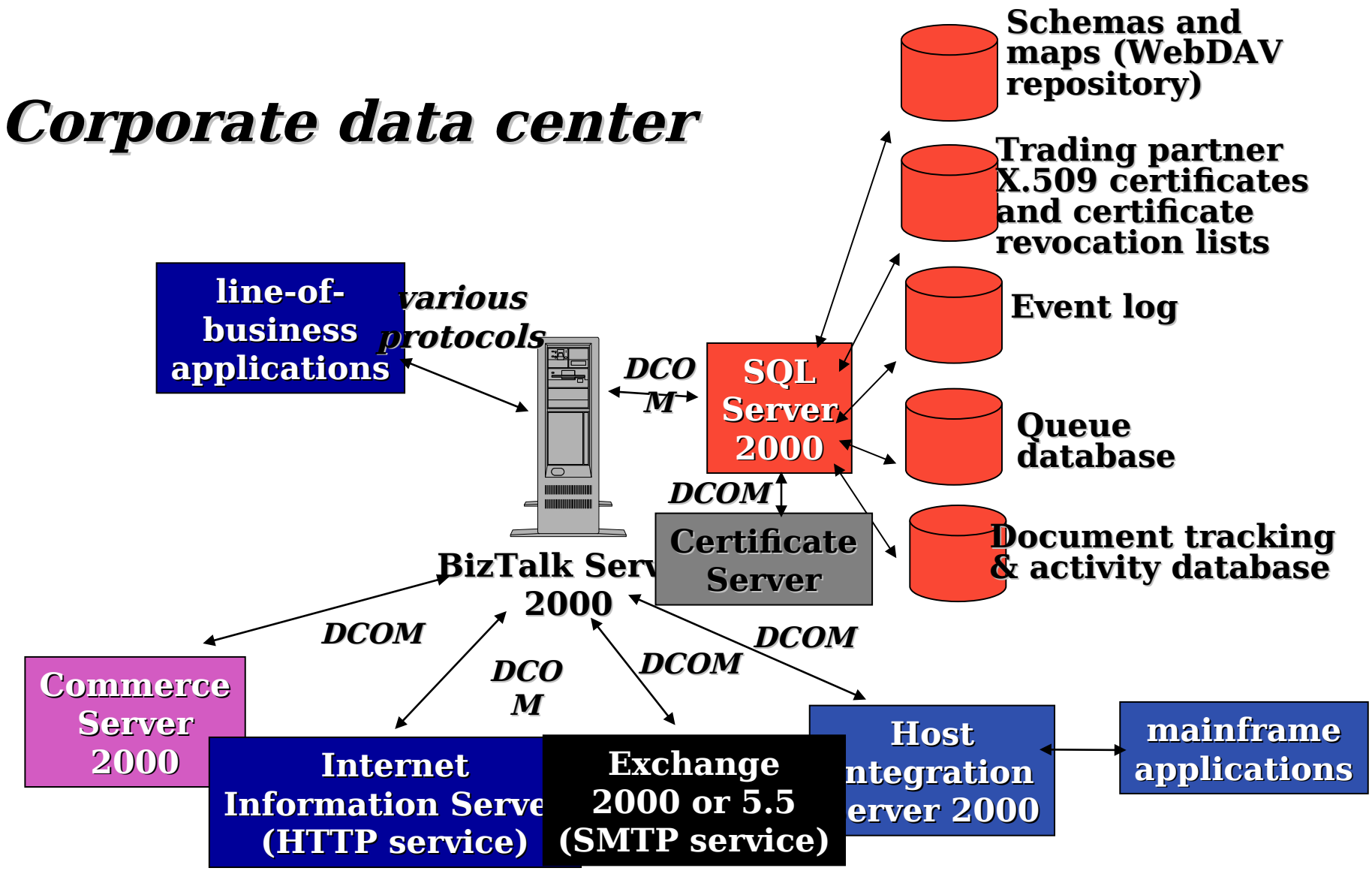
- **Built-In Services**
  - **Sequencing, concurrency, branching**
  - **Dynamic flow topology**
  - **Transaction integration and compensation**
  - **Persistence**
    - **DB schema representation of process**
  - **Management and monitoring**
  - **Integration**
- **Visual Process Design Environment, XLANG Language export , and Orchestration Engine**

BizTalk Orchestration

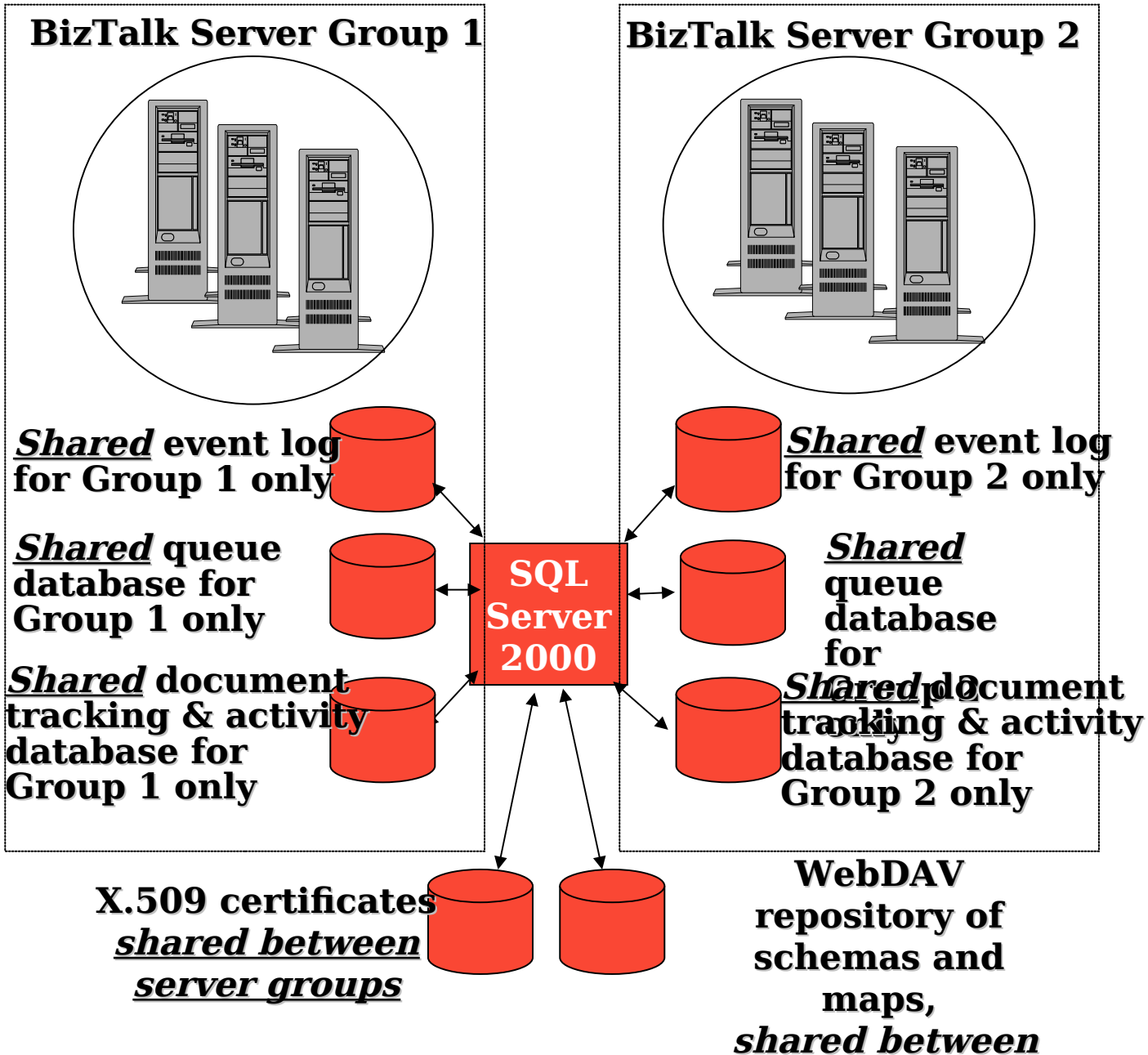
Enterprise Application Integration



ngle-Server Data Center Deploymen of BizTalk Server 2000



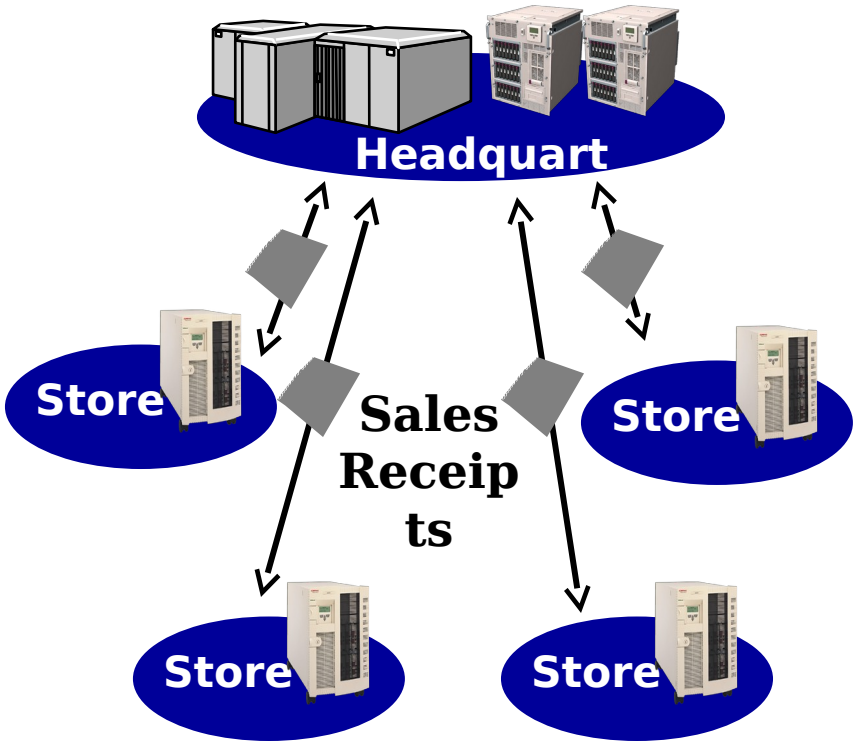
BizTalk Farms


BizTalk Server Group 1
BizTalk Server Group 2
Shared event log for Group 1 only
Shared queue database for Group 1 only
Shared document tracking & activity database for Group 1 only
SQL Server 2000
Shared event log for Group 2 only
Shared queue database for Group 2 only
Shared document tracking & activity database for Group 2 only
X.509 certificates shared between server groups
WebDAV repository of schemas and maps, shared between

Case Study—Marks & Spencer
UK's premier retailer since 1884

- **Over 500 stores worldwide including Brooks Brothers & Kings Supermarkets**
- **$13 billion in annual revenues**
- **Need global supply chain to compete**
  - **Manage richer data in near real time**
  - **Optimize inventory management**
  - **Be more responsive to retail business**

Case Study—Marks & Spencer



Using BizTalk to move detailed sales data to corporate headquarters and integrate with multiple back-end systems

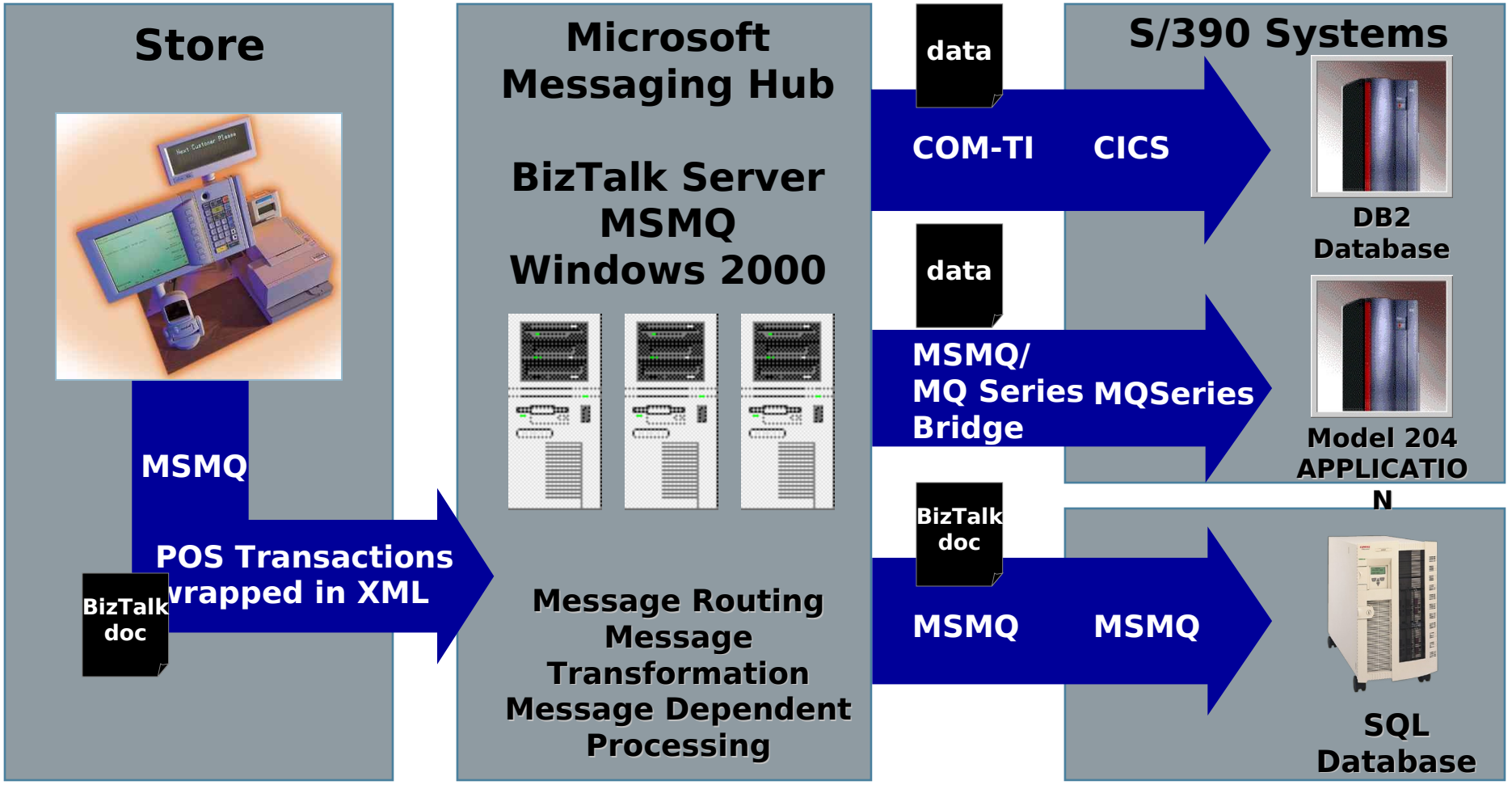
Business Challenges

- **Lack of detail in summarized sales receipt batches**
- **Sales information flowing too slowly to back-end systems and supply chain partners**
- **Fragmented infrastructure made information sharing difficult**

Business Benefits

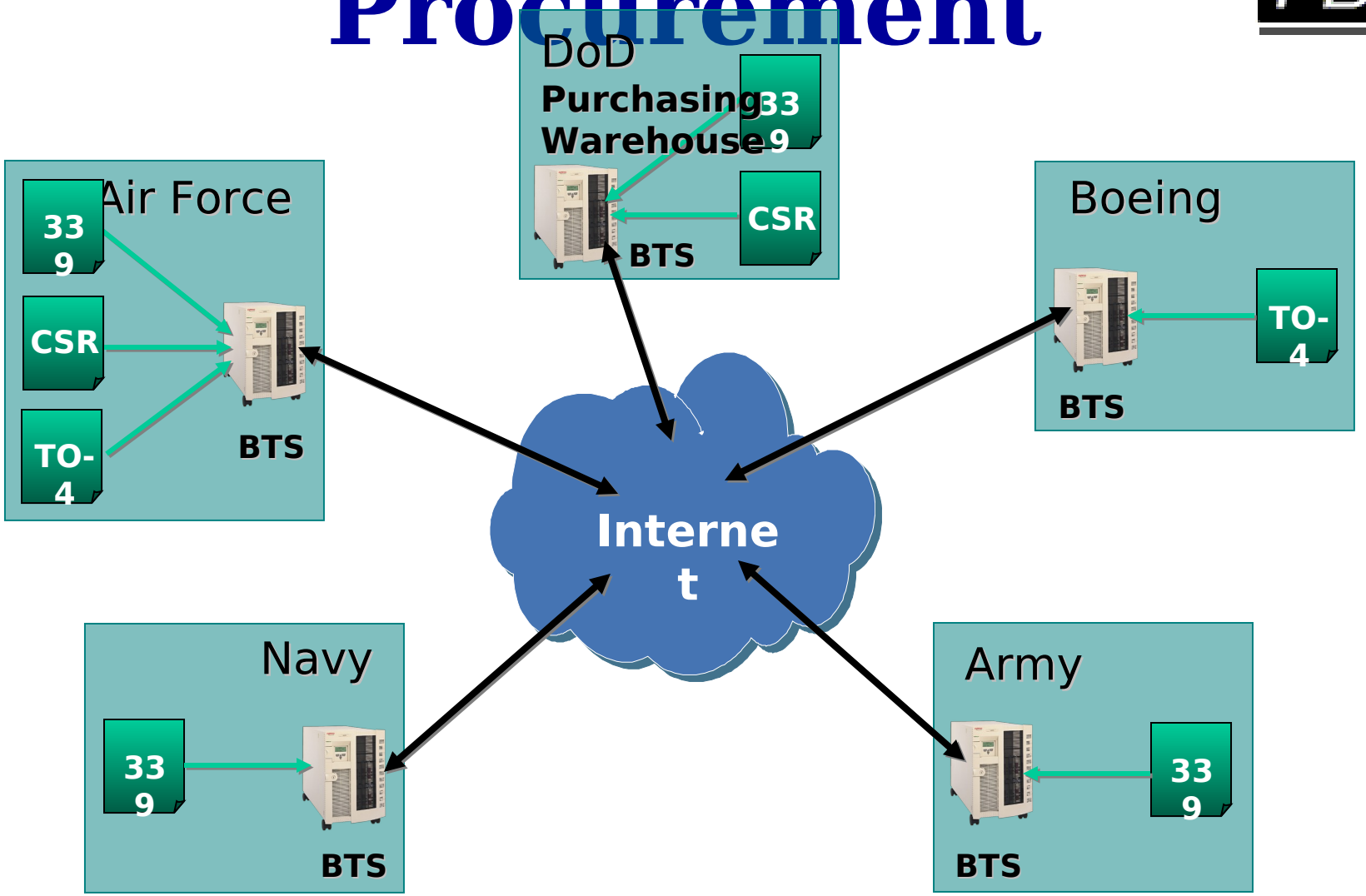
- **Near real-time sales information flowing to back end**
- **Sales detail allowing sales detail and trend insight**
- **Integrated system allowing sales receipts, promotions, and replenishment orders to flow over same infrastructure**

Case Study—Marks & Spencer



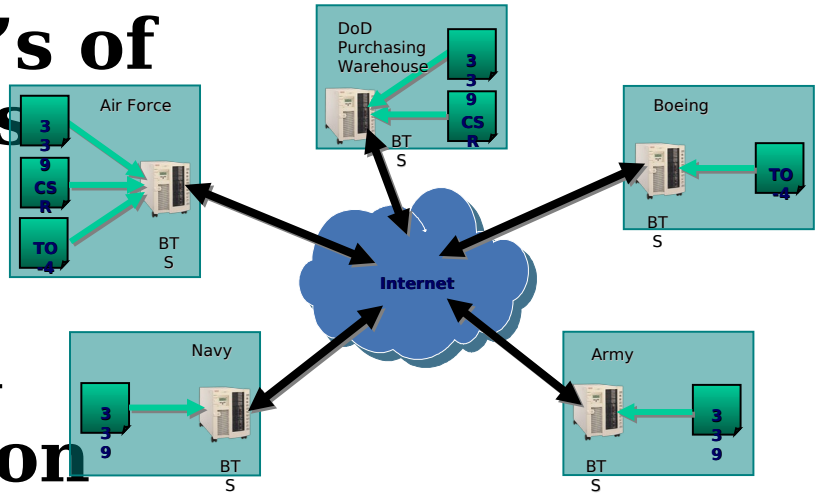
Real-time store data transfer for POS transactions

Case Study—U.S. Government Procurement



Case Study—U.S. Government Procurement

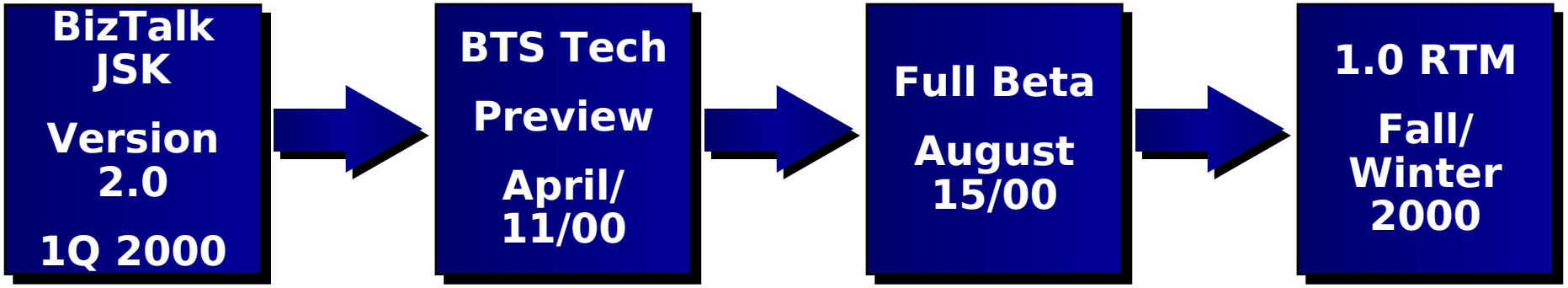
- **Microsoft's BizTalk Server benefits**
  - **Interoperability without forcing standardization on one Product Data Management System (PDM)**
  - **Automate flow of 1000's of government documents**
  - **Deal with business processes at data level instead of display level**
  - **Supply chain automation within agencies, between agencies, and with third parties**



BizTalk Server 2000 Requirements

- **Windows 2000 Server**
- **SQL Server 2000 or SQL 7.0 w/ SP2**
- **Visio 2000 SR1**
- **Premier support**
- **Trained Partner or MCS**

BizTalk Server 2000 Roadmap



- VB add-in to create COM objects from XML Schema
- XMLSchema validation tool
- BTS compatible adapter interface
- Document routing engine
- Sample code
- Industry

- Document Interchange
- Schema creation and mapping tools
- New management object model and UI
- Trading Partner Management UI.
- BizTalk Framework 1.0 compatible
- Performance and stability
- SAP DCOM connector
- ISK to Tech

- Integrated Business Process Orchestration design tools
- Reliable messaging (Once Only)
- Full management UI
- Integration with Commerce Server 2000
- Connectors for key applications

- All features stabilize d

BizTalk Information Sites

- **Main BizTalk site:**
  http://www.microsoft.com/biztalk
- **Learn about XML, XML-Schema, and the BizTalk Framework**
  http://msdn.microsoft.com/xml
  http://msdn.microsoft.com/xml/XMLGuide/schema-overview.asp
- **Get involved in the BizTalk.org community**
  http://www.biztalk.org
- **Download the BizTalk Server 2000 Beta 1**
  http://www.microsoft.com/biztalkserver
- **Bobang@microsoft.com**

Questions?